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BOTANICAL ABSTRACTS

A monthly serial furnishing abstracts and citations of publications in the international field of botany in its broadest sense.

UNDER THE DIRECTION OF

THE BOARD OF CONTROL OF BOTANICAL ABSTRACTS, INC.

J. R. SCHRAMM, Editor-in-Chief
National Research Council, Washington, D. C.

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MARCH-APRIL, 1923

No. 3

ENTRIES 1532-2224

AGRONOMY

C. V. PIPER, *Editor*

MARY R. BURR, *Assistant Editor*

(See also in this issue Entries 1645, 1652, 1759, 1777, 1782, 1801, 1811, 1836, 1873, 1887, 2039, 2080, 2132, 2133, 2160, 2162)

1532. ANONYMOUS. A classification and detailed description of some of the wheats of Australia. Commonwealth of Australia Inst. Sci. and Indust. Bull. 18. 48 p., 5 pl. (1 colored). 1920.—Classification is based upon 8 botanical and 4 agricultural characters, each of which is described in some detail. There are described 43 varieties of *Triticum sativum*, included in 22 "types," and 3 varieties of 3 types of *T. durum*. The history of each variety is indicated.—*L. R. Waldron*.

1533. ANONYMOUS. Det kgl. danske Landhusholdningsselskabs Generalforsamling. [The Royal Danish Agricultural Society's annual general meeting.] Tidsskr. Landokonomi 1922: 125-142. 1922.—This article gives the society's recommendations for a better system of regulating the importation of grain and cattle feed into Denmark.—*Albert A. Hansen*.

1534. ANONYMOUS. Die Feststellung des Düngerbedürfnisses der Böden durch einfache Düngungsversuche. [Determining the fertilizer requirement of soils by simple fertilizer experiments.] Mitteil. Deutsch. Landw. Ges. 37: Flugblatt 62. 1922.—Popular.—*A. J. Pieters*.

1535. ANONYMOUS. Tobacco growing in Ireland. The experiments in 1921. Jour. Dept. Agric. Ireland 22: 26-30. 1922.—Various difficulties in growing and marketing are detailed.—*Donald Folsom*.

1536. BAKER, O. E., C. F. BROOKS, J. R. COVERT, and R. G. HAINSWORTH. Seedtime and harvest. A graphic study of seasonal work on farm crops. U. S. Dept. Agric. Dept. Circ. 183. 53 p. 1922.—This is a presentation of maps showing dates when planting, harvesting, and other operations are performed in the culture of staple crops in different parts of the U. S. A.—*L. R. Hesler*.

1537. BARTLETT, H. Western wheat growing competition. An analysis of the scale of points. Agric. Gaz. New South Wales 33: 714-718. 1922.—The following points are discussed: trueness to type, freedom from disease, evenness, cleanliness, condition and appearance, and apparent yield.—*L. R. Waldron*.

1538. BECKETT, EDWIN. *Potatoes, with a chapter on the artichoke*. 31 p. Country Life: London; Charles Scribner's Sons: New York, 1922.—A brief consideration of the subject in 10 chapters, covering history and general notes; the most suitable soils and their preparation; time and methods of planting, harvesting, and storing; raising in hot beds and cold frames; exhibition work; seed selection for new varieties; insect and fungous diseases; and a classification of a few varieties as to season, outdoor, bed and frame, and exhibition purposes. A final chapter is devoted to the artichoke, covering briefly its history, planting, harvesting, varieties, and preparation for the table.—*P. L. Ricker*.

1539. BEVERIDGE, WM. *Weather and harvest cycles*. *Economic Jour.* 31: 429-452. 1921.—Detailed harmonic analysis of data on the price of wheat in Western Europe during the 300 year period 1500-1869 discloses about 20 distinct cyclic periods varying in length from 2.2 to 68 years. When 11 of the most pronounced of these cycles are combined into a single "synthetic" curve and this curve projected through the years since 1850 it is found that this hypothetical projection synchronizes very closely with a similar curve for rainfall during that period. Especial significance is attached to the fact that the depressions in the price curve are followed by periods of lack of rain, lack of rain being generally beneficial to wheat in the area under discussion. The investigator believes that periodicity in weather exists, although he does not consider prognostication possible without more elaborate investigation.—*L. W. Kephart*.

1540. BOLLEY, H. L. *Potatoes, varieties for North Dakota*. [In: *Potato hand book*.] North Dakota Agric. Exp. Sta. Ext. Div. Circ. 50. 2-7, 3 fig. 1922.—Points in selecting varieties and the best varieties for the state are considered, followed by notes on the merits of other varieties.—*P. L. Ricker*.

1541. BREAKWELL, E., and G. G. ST. CLAIR POTTS. *Sudan grass*. New South Wales Dept. Agric. Farmers' Bull. 126. 17 p., 4 fig. 1919.—Sudan grass was introduced into New South Wales in 1913. It is adapted to all localities below 3000 feet elevation but thrives best along the coast and under irrigation. At Nyngan it has matured seed and attained a height of 5 feet on less than 4 inches of rain. Sudan grass has generally greatly outclassed millets in yield. It responds very readily to fertilizers. Perennial strains of Sudan grass have been reported from 2 localities. Cultural notes are given.—*L. R. Waldron*.

1542. BURGESS, J. L. *Limestone in relation to agriculture*. Part 1. *Limestone and soil fertility*. Part 2. *Future of the agricultural lime industry*. Bull. North Carolina Dept. Agric. 1922: 1-24. Sept. 1922.—This is a revision of Bull. 9 (whole number 265) 1919, and contains no new material. It is published also in *Rock Products* 22: Nov. 1919.—*F. A. Wolf*.

1543. BURSE, W. *Möglichkeiten und Ziele für den deutschen Tabakbau*. [Possibilities and aims for German tobacco culture.] *Mitteil. Deutsch. Landw. Ges.* 37: 602-605, 616-618. 1922.—The author points out that the most important matter is improvement in the quality of German-grown tobacco. Some of the problems of selection, breeding, soils, and fertilizers are discussed.—*A. J. Pieters*.

1544. BUSS. *Ein Beitrag zur Futterpflanzenzüchtung*. [A contribution to the breeding of forage plants.] *Mitteil. Deutsch. Landw. Ges.* 37: 443-445. 1922.—A general statement of methods and of difficulties is presented. Isolation of selections in the field has proved more satisfactory than caging. Vegetative reproduction where possible is an effective method of preliminary increase.—*A. J. Pieters*.

1545. CALVINO, M. *El cultivo herbáceas de una planta arbórea para producir abono verde*. [Cultivation of an arboreal plant to produce green manure.] *Mem. Soc. Cubana Hist. Nat.* "Felipe Poey" 4: 32-43. Pl. 1. 1922.—The author discusses the value of *Cassia siames*, Lamk. as a source of green manure and recommends its use for reforestation. He also calls attention to *Albizzia lebbek*, Benth. and *Prosopis juliflora* (Sw., E. DC.) for similar purposes.—*J. A. Faris*.

1546. CHAMBLISS, C. E. Wild rice. U. S. Dept. Agric. Dept. Circ. 229. 16 p., 9 fig. 1922.—Wild rice (*Zizania aquatica* L. and *Z. palustris* L.), which is distantly related to cultivated rice, is the principal food of wild ducks and other waterfowl and is used to a limited extent by man. A discussion of the growing of wild rice is given.—*L. R. Hesler*.

1547. CHEEL, E. The weeds of civilization. Australian Nat. 5: 25-28. 1922.—The author tells how the weeds were introduced and gives the names of some of the more common ones. *Leucaena glauca* Benth. causes horses to lose the hair of the mane and tail, and causes pigs to lose all hair.—*T. C. Frye*.

1548. CHOMLEY, F. G., and F. A. CHAFFEY. Producing lucerne hay under irrigation. Methods and experiences at Yanco experiment farm. New South Wales Dept. Agric. Farmers' Bull. 143. 22 p., 19 fig. 1921. [See Bot. Absts. 11, Entry 19.]

1549. CHRISTENSEN, ANTON. Intryk fra Islands Landbrug. [The agriculture of Iceland.] Tidsskr. Landokonomi 1922: 261-293. 1922.—The island appears to have little future as an agricultural country since grass crops are not produced to any extent because of the rigorous climate. Iceland is better adapted to raising cattle and sheep, as the climate is well suited to the production of hay. Potatoes, cabbage, and turnips make good growth.—*Albert A. Hansen*.

1550. CONNER, A. B., and R. E. KARPEN. Shelling percentage in grain sorghum. Texas Agric. Exp. Sta. Bull. 294. 2 p. 1922.—Sixty million bushels of grain sorghum are produced annually in Texas. The data extend over a period of 6 years. The grain content of the heads varies from 69.53 to 75.23 per cent, or from 1390 to 1504 pounds to the ton of heads. Individual strains show considerable variation.—*L. Pace*.

1551. COPLAND, D. B. Wheat production in New Zealand. Chapter on Improvement in wheat by selection in New Zealand by F. W. HILGENDORF. Introduction by JAMES HIGHT. xx + 311 p. Whitcombe & Tombe, Ltd.: Auckland and London, 1921 (?).—This is mainly an economic treatise published "in the hope that it may help to form a sound public opinion on an industry which has for the last few years been thrust unpleasantly into public notice through the shortage of home-grown supplies of wheat, difficulties of importation, high prices, and the inconveniences of government regulation." Consumption, production, quality improvement and prices of wheat, general conditions, history, periods, cost of production, and other related topics are considered. In the chapter on improvement the methods of developing and introducing pure strains of wheat are outlined. "College Hunter's," a pure line of Hunter's (one of the important wheats of New Zealand) has been introduced. Preliminary trials indicate that it yields 4 bushels per acre more than the commercial seed. Promising strains of this and other varieties are still under trial.—*C. E. Leighty*.

1552. COUEY, WORTH G. The potato seed plot. [In: Potato hand book.] North Dakota Agric. Exp. Sta. Ext. Div. Circ. 50. 19-21. 1922.—Preparation of the seed plot, planting, and inspection for diseases are discussed.—*P. L. Ricker*.

1553. DAVIDSON, W. D. Profitable potato growing. Jour. Dept. Agric. Ireland 22: 140-149. 2 fig. 1922.—Recommendations are detailed for improving the current Irish methods.—*Donald Folsom*.

1554. DIETRICH, F. O. Zur Phosphorsäurefrage. [The phosphoric acid question.] Mitteil. Deutsch. Landw. Ges. 37: 600-602. 1922.—In this general statement regarding the necessity of phosphates, the author refers to some of the important papers but adds no new data.—*A. J. Pieters*.

1555. DOBRESCU, I. M. Le climat et la blé roumain. (Das Klima und der rumanische Weizen.) [Climate and Roumanian wheat.] Bull. Soc. Științe Cluj 1: 171-176. 1921.—The

Roumanian soils as well as the climate are well suited to the culture of wheat. The author inquires in how far the climate influences wheat yields. He establishes the fact that the quantity of the crop depends on the intensity of assimilation before blooming time, which means for Wallachia before the end of May and for Moldavia by the middle of June. This assimilation is again dependent on the water content of the soil and consequently on the rainfall. The quality of the crop on the other hand is controlled by the light and temperature relations during the formation of the kernels, thus favored by dry, warm weather from blooming to maturity. According to the writer, these favorable conditions obtain all over Roumania, but especially in the neighborhood of Cluj and Botoșani.—*M. Tiesenhausen.*

1556. EASTERBY, H. T. Sugar experiment bureau. Summary of 21 years' work. (Continued.) Part IV. Australian Sugar Jour. 14: 408-412. 1922.—A résumé is given of results of experiments started in 1905 at Mackay to determine the most suitable distances between the plants in the row and the width between the cane rows. Plants only 6 inches apart in the row yielded over 11 tons of cane more per acre than when grown 36 inches apart. Cane from rows planted 4 feet apart gave 20 tons per acre more than when rows were 7 feet apart. Also the yield of sugar per acre was greater for the thicker planting. The variation in distance between the rows had a much more definite bearing upon the crop results than the variation of distance between the plants. Soils and climatic conditions have an influence on these results.—*C. Rumbold.*

1557. EASTERBY, H. T. Sugar experiment bureau. Summary of 21 years' work. (Continued.) Part V. Australian Sugar Jour. 14: 479-483. 1922.—There has been a constant introduction and testing of cane varieties at the Mackay Sugar Experiment Station since 1895. They are tested by cropping and chemical analyses. Two of these introduced canes; New Guinea 15 or Badila and N. G. 24 or Goru, are very valuable. The results of the tests in yield of cane and of sugar for these 2 and other canes are given in tables.—*C. Rumbold.*

1558. EASTGATE, J. E. How I grow potatoes in eastern North Dakota. [In: Potato hand book.] North Dakota Agric. Exp. Sta. Ext. Div. Circ. 50. 8-10, 2 fig. 1922.—Time and method of preparing the soil, treatment and planting of seed potatoes, cultivation, harvesting, and loading for the market are discussed.—*P. L. Ricker.*

1559. FINKE, H. L. Potato culture in northwest North Dakota. [In: Potato hand book. North Dakota Agric. Exp. Sta. Ext. Div. Circ. 50. 10-11. 1922.—Details are given of soil preparation, cultivation, and spraying.—*P. L. Ricker.*

1560. FISCHER, HERMANN. Über den Einfluss der Humussäuren auf unsere Kultur] pflanzen. [Concerning the effect of humus acids on our cultivated plants.] Mitteil. Deutsch. Landw. Ges. 37: 559. 1922.—The author describes certain effects of humus acids such as the wrinkled, brown spotted leaves of beans and the pale green color of oats, barley, peas, and vetches. Pear leaves become folded and leaves of apple become brown spotted and dry from the margin toward the middle. These effects are said to be due to physiological drying, the plants producing few root hairs and absorbing little of the acid solution.—*A. J. Pieters.*

1561. FRANCK, W. J. Algemeene gezichtspunten betreffende unificatie van de methoden van zaadenderzoek in het belang van den handel, meer speciaal met betrekking tot de zuiverheid van het zaad. [General views on unification of methods in seed testing as to its importance for the trade, and especially with relation to the purity of seed.] Cultura 34: 270-280. 1922.—In recent years much stress has been laid by the seed trade upon uniformity in methods of seed control. In the Netherlands at first the Irish, later the continental system, was used. In the seed trade of the Netherlands the following formula has been much in use: $\text{usefulness} = \frac{\text{purity} \times \text{germinating power}}{100} - 3 \times \text{harmful impurity}$. The writer suggests that in accordance with his predecessor, F. F. Bruijning, a uniform international technique and system for seed testing should be adopted, and the term grade should be used, since this word is practically the same in all languages.—*J. C. Th. Uphof.*

1562. GASSER, G. W. Report of work at Rampart station. Rept. Alaska Agric. Exp. Sta. 1920: 20-36. Pl. 2-3. 1922.—The report shows that late spring and cool summer nearly resulted in crop failure. Alaska peas were grown both for hay and seed. Oats were also used for hay. *Medicago falcata* is the only hardy alfalfa. *Vicia cracca* and *Trifolium lupinaster* are hardy. Reports are made on spring wheats, oats, and barley, including well known types and many hybrids originated at the station. Hemp and buckwheat ripened 25 per cent of seed while flax ripened only 2 per cent. Turnips, rutabagas, cabbage, and peas ripened seed, but carrots and sugar beets did not. Potatoes in variety were grown, also the following vegetables; pe-tsai lettuce, Swiss chard, carrots, beets, sugar beets, parsnips, spinach, beans, peas, tomatoes, cabbage, cauliflower, turnips, and celery. One head of Copenhagen Market cabbage weighed 27 pounds. Pepper, egg plant, cucumber, and muskmelon were started in the greenhouse and grown in cold frames. Hybrid strawberries from Sitka station produced fruit. Notes on flowering plants are given.—J. P. Anderson.

1563. GERLACH und KÜNTZEL. Über die Aufbewahrung der grünen, wasserreichen Futterpflanzen und der wasserhaltigen Abfallprodukte landwirtschaftlicher Nebengewebe. [Concerning the preservation of green succulent fodder plants and of the succulent waste products of agricultural industry.] Mitteil. Deutsch. Landw. Ges. 37: 630-637. 1922.—The authors describe the various forms of containers in which plant material is preserved. The common unwallied pit is not satisfactory nor is the walled pit as good as the other types, 5 of which are described in some detail, namely, fermentation chambers, German feed tower, peasants silo (Bauernsilo), American feed tower, and electro-feed container. Reference is made to firms dealing in these various types. The authors also discuss under 7 heads the essentials to be observed in the construction of such containers. A bibliography is appended.—A. J. Pieters.

1564. GRAHAM, I. D., and T. D. HAMMATT. Some factors in agricultural cost production. Trans. Kansas Acad. Sci. 30: 225-232. 1919/1921 [1922].—The purpose of this paper is to give in detail the facts which are absolutely necessary in the determination of any reliable statistics concerning [a] farm crop, including particularly land and buildings, use of machinery, seed, seed bed preparation, harvesting, threshing, hauling to market, insurance, fertilizer, interest on seed and seed bed, crop risk, rent, management, and credit by straw and pasture.—F. C. Gates.

1565. HANSEN, K. Planteavlten 1920. [The harvest, 1920.] Tidsskr. Landokonomi 1921: 421-443. 1921.—An estimate is made of the acreage of the staple crops in Denmark during 1920. A large acreage was seeded to peas for cattle feed and the majority of the root crops were grown for cattle feeding. Potatoes were exported to a limited extent, but the freight rates were too high to permit extensive exportation. During the world war the production of seed crops was highly developed but the production of seed dropped considerably after the war. The 1920 harvest is discussed and statistics presented.—Albert A. Hansen.

1566. HARLAN, H. V., M. N. POPE, and L. C. AICHER. Trebi barley, a superior variety for irrigated land. U. S. Dept. Agric. Dept. Circ. 208. 8 p. 1922.—Trebi barley, a 6-rowed, bearded variety, is a pure line descended from selection of a single plant. Introduced from Asiatic Turkey it is being distributed to American farmers. It is especially adapted to irrigated land in southern Idaho and is recommended for irrigated lands where the summer season is similar to that of southern Idaho. It is not recommended for non-irrigated lands.—L. R. Hesler.

1567. HAUTEN, A. VAN. Einwirkung verschiedener Düngemittel auf Vietsbohnen. [Action of different fertilizers upon the kidney bean.] Jour. Landw. 70: 1-7. 1921.—The effects of the fertilizer combinations, K, N, P_2O_5 , K + P_2O_5 + N, K + N, K + P_2O_5 , and P_2O_5 + N upon the growth and yield of the kidney bean are described. Chemical analyses of the ash and the dry substance show that the plants required little N and P_2O_5 , while the need for K was very great. Plots fertilized with K gave the greatest yields, as well as high starch, fat, and ash content.—F. M. Schertz.

1568. HAYWOOD, A. H. The culture of sugar cane in New South Wales. New South Wales Dept. Agric. Farmers' Bull. 139. 36 p., 12 fig. 1921. [See Bot. Absts. 9, Entry 612.]

1569. HOFFMAN, M., und O. NOLTE. Düngungsversuche mit Stickstoffdüngern. [Fertilizer experiments with nitrogenous fertilizers.] Mitteil. Deutsch. Landw. Ges. 37: 540. 1922.—The authors report on a test of nitrogenous fertilizers carried on by cooperating farmers. A tabulated statement of returns from the use of sodium nitrate, ammonium sulphate, ammonium chloride, ammonium sulphate-nitrate (ammonsulphat salpeter), and ammonium-potassium nitrate on rye, winter wheat, oats, and potatoes shows that the various fertilizers had practically equal value.—A. J. Pieters.

1570. HOFFMAN, und O. NOLTE. Düngungsversuche mit verschiedenen Kali-Salzen zu Kartoffeln im Jahre 1921. [Fertilizer investigations with various potash salts on potatoes in the year 1921.] Mitteil. Deutsch. Landw. Ges. 37: 497-498. 1922.—Potassium magnesium sulphate, potassium sulphate, and 40 per cent potassium nitrate were tested. In general the yields were greater after using the first.—A. J. Pieters.

1571. HOFFMAN, M., und O. NOLTE. Vergleichende Phosphorsäuredüngungsversuche. [Comparative fertilizer experiments with phosphoric acid.] Mitteil. Deutsch. Landw. Ges. 37: 442-443. 1922.—A comparison of Thomas meal containing 15 per cent citric acid-soluble phosphoric acid and Rhenaniaphosphate containing 11 per cent on rye, barley, oats, and sugar beets showed that the 2 forms were of equal value.—A. J. Pieters.

1572. HOYER, JAMES. Det kgl. danske Landhusholdningsselskabs Kontrol med Korn og Foderstoffer i Kobenhavns Frihavn i Aaret 1921. [The Royal Danish Agricultural Society's control of importing grain and feed into Copenhagen's Free Harbor during the year 1921.] Tidsskr. Landøkonomi 1922: 191-198. 1922.—The author presents numerous tables and discusses the relationship of this society to the importation of grain and feed into Denmark during 1921.—Albert A. Hansen.

1573. JONES, J. M., R. A. BREWER, and R. E. DICKSON. Grain sorghums versus corn for fattening baby bees. Texas Agric. Exp. Sta. Bull. 296. 25 p. 1922.—The test continued 165 days. Details of feeding, preparation of the different foods, care of the stock, climate, and other data are given. The steers fed on grain sorghums, made more economical gains than did those fed on corn.—L. Pace.

1574. KARPEN, R. E. Varieties of cotton in northwest Texas. Texas Agric. Exp. Sta. Bull. 299. 26 p. 1922.—The author reports experiments from 1912 to 1921 at Substation 8, near Lubbock, Texas, about the center of the south Plains region.—Cotton production in the counties wholly or partly in the Plains increased from 9,240 bales in 1909 to 132,489 in 1919. This is due to the selection of varieties better suited for general culture in this locality, to the arrival of cotton growers from the eastern southern states, to freedom from boll weevil, and to the greater amount of land available for cultivation. Cotton has proved one of the most drought-resistant crops for this section. A table shows the precipitation for the period with a minimum of 8.73 inches in 1917 and a maximum of 31.88 in 1915. In 2 other years there was a precipitation of over 31 inches, but all others had less than 20, which, however, was fairly well distributed in spring and summer.—L. Pace.

1575. KIESSLING. Einige Gegenwartsfragen der Planzenzüchtung und des Saatbaues. [Some present questions of plant breeding and seed growing.] Mitteil. Deutsch. Landw. Ges. 37: 454-458. 1922.—In this address the author discusses the selection of pure strains out of mixed populations, selection of mutations, and crossing. Most of the improvement work thus far has been by the 1st method though the author believes that crossing holds great possibilities. Special mention was made of the need for breeding, among others, forage crops, clovers, grasses, and vetches. The establishment of gardens for preserving all old varieties

was urged since such varieties may prove useful in breeding. Potato selection was discussed at length and requirements proposed to be met before new varieties might be registered. Suggestions were made regarding the distribution of improved seed.—A. J. Pieters.

1576. MATENAERS, F. F. *Neuere Erfahrungen mit der Sonnenblumensilage*. [New experiences with sunflower silage.] *Mitteil. Deutsch. Landw. Ges.* 37: 499-500. 1922.—The author briefly reviews recent work on sunflower silage in the U. S. A., and especially in Montana.—A. J. Pieters.

1577. MOODIE, A. W. S. *Field experiments with maize. Grafton experiment farm, 1921-22*. *Agric. Gaz. New South Wales* 33: 709-713. 1922.—Work was done with the Leaming variety. Data upon residual fertilizer effect showed that superphosphate applied Nov. 1919, resulted in a net gain of \$4.25 per acre over no fertilizer and superphosphate applied each year gave a net gain of \$5.40 per acre over no manure, for the crop of 1922.—Time of plowing trials showed a net gain of \$8.65 per acre for the early (winter) plowing over the late (spring) plowing.—Cultivation carried on to tasseling time showed a net gain of \$3.50 per acre in comparison with only 1 cultivation after hilling.—In a comparison of hilling with flat cultivation the average net loss for hilling was \$3.72 per acre.—In a desuckering trial, maize plants were grown individually 12 inches apart in rows 4 feet apart. The maize was planted Oct. 26 and was desuckered Jan. 11. The amount of suckering was heavy. The net loss to the crop from desuckering was \$6.68 per acre; allowance was made for the forage value of the suckers.—L. R. Waldron.

1578. MUNTEANU, ANASTASE V. C. *Contribuțiuni la Ameliorarea grâului românesc*. (Teze). [Contribution to the improvement of Roumanian grains. (Thesis)] 94 p., 8 pl. *Cartea Românească*: Cluj, 1922.—The author first discusses the present condition of wheat breeding, then methods used in his work. He started with the commonly esteemed domestic variety "Grâul bălan românesc" of *Triticum vulgare erythrospermum*, of which the botanical and biological characters are given. After 6 years' selection the author secured a type which, besides being highly resistant to rust and lodging, yields 18 per cent more than the parent type. In order to further improve the plants studied, hybridization as well as selection was used. Crossing Line No. 148 with Strubes square head and with Mettes square head, the author secured 6 crosses, all of which exceeded the pure line No. 148 in real value. One of these crosses was grown on 2 hectares with gratifying results. Many tables are included.—M. Tiesenhausen.

1579. NEWTON, W. *Forage crops for the Lower Fraser Valley*. *Agric. Jour. [British Columbia]* 7: 36-37. 1922.—In this address varieties of clover are discussed and white Dutch advocated for burned over pasture lands. The use of silage, particularly clover silage, is recommended and the trench silo described. A mixture of orchard grass, tall oats, and meadow fescue is recommended as desirable and timothy declared particularly valuable on the poorly drained delta soils. Intertillage crops and root crops are included in the discussion and man-gels designated as the leading root crop for the dairymen of the region under consideration.—Mary R. Burr.

1580. NOBLE, E. G. *The work of the Yuma reclamation project experiment farm in 1919 and 1920*. U. S. Dept. Agric. Dept. Circ. 221. 37 p., 10 fig. 1922.—This reports crop experiments on cotton, alfalfa, sorghums, wheat, flax, legumes, orchard fruits, and vegetables.—L. R. Hesler.

1581. OBERSTEIN. *Farbmutationen der Kartoffelschalenfarbe*. [Color mutations of potato skin color.] *Mitteil. Deutsch. Landw. Ges.* 37: 666. 1922.—The author describes a tuber mutation in which the color of the tubers was piebald, the boundaries of the white and red color being sharply defined and differing in arrangement in different tubers.—A. J. Pieters.

1582. PARK, J. B., C. J. WILLARD, and H. L. BORST. **Growing soybeans in corn.** Ohio Agric. Exp. Sta. Monthly Bull. 7: 75-78. 1922.—This is a report of 3 years' experience in growing corn and soy beans in combination. It has been found practical to drill the corn and soy beans in the same row and at the same time. The test suggests that the poorer the soil in organic matter and nitrogen the more likely the combination is to out-yield the corn alone, while on rich soil the reverse is true. Suggestions are given regarding the time of planting, also rate and distance of planting. The Peking, Virginia, and Wilson varieties proved especially useful for this practice.—*R. C. Thomas.*

1583. PETERSEN, K. DOLPH. **Beretning fra Statsfrokontrollen fra 1 Juli 1920 til 30 June 1921.** [Report of state seed control from July 1, 1920, to June 30, 1921.] Tidsskr. Planteavl 28: 129-175. 1922.—Of the 26,922 samples of seed tested, 15,928 were for dealers, 10,271 for growers, and 753 for the state. Samples were received from all parts of Europe and from the U. S. A. The principal kinds were grains, grasses, peas, and beets. The samples were tested for weed seeds, diseases, germination, weight, and water content. Dealers are required to make certain guarantees regarding purity and germination; if the seed does not meet the guarantee an indemnity must be paid, the amount of which is determined by the Board of Seed Control.—*Albert A. Hansen.*

1584. PITT, J. M. **Last season's maize yielding contests.** The lower north coast. Agric. Gaz. New South Wales 33: 695-702. 1922.—Yields are given for various varieties at different localities.—*L. R. Waldron.*

1585. RADER, F. E. **Report of work at Matanuska station.** Rept. Alaska Agric. Exp. Sta. 1920: 48-58. Pl. 6-8. 1922.—Rye wintered perfectly. Of spring grains, several varieties each of barley, wheat, and oats were grown. Some varieties of each ripened and produced well, but others were only partly ripe when frosted Sept. 23. Sunflowers for silage did not do well. Smooth brome grass, Kentucky blue grass, timothy, and meadow fescue wintered well; but orchard grass, redtop, Italian rye grass, English rye grass, and crested dogs-tail mostly winter-killed. About 40 per cent of Grimm alfalfa survived the winter, but common and Turkestan alfalfas were killed. A few red clover plants and not over 50 per cent of white clover survived the winter. Canada field peas ripened very little seed. Of 40 varieties of potato grown 7 are recommended. The highest yield approached 425 bushels per acre. Seedling potatoes from the Sitka station were also tested. Sugar beets and other root crops gave fair results. All apple trees planted in 1918 had died. Red and black currants produced good crops, but gooseberries and red raspberries froze back considerably. A strawberry bed was killed by ice cap due to lack of drainage. Tartarian honeysuckle and *Rosa rugosa* are recommended. Small fruit plants are being grown for distribution among settlers of the region. The usual hardy vegetables were grown.—*J. P. Anderson.*

1586. RATCLIFFE, GEORGE T. **The work of the San Antonio experiment farm in 1919 and 1920.** U. S. Dept. Agric. Circ. 209. 39 p. 1922.—The author reports on rotation, tillage, and similar practices; on crops, including cotton, corn, sorghums, small grains, field peas, flax, Rhodes grass, peaches, plums, jujube (the Chinese date, *Zizyphus* sp.), Japanese persimmons, apricot, pecan, citrus, etc., and on cotton root-rot.—*L. R. Hesler.*

1587. REICHELT. **Ergebnis eines dreijährigen Anbauversuchs mit zwei Spätkarottensorten.** [Results of a 3-year culture test with late carrots.] Mitteil. Deutsch. Landw. Ges. 37: 471. 1922.—The results of tests of 2 late varieties of carrots made at various stations are reported, Long Red Sudenburger giving best yields.—*A. J. Pieters.*

1588. REYNOLDS, MARK H. **Farmers' experiment plots.** Maize experiments 1921-22. North-western district. Agric. Gaz. New South Wales 33: 703-707. 1 fig. 1921.—Experiments were conducted upon 11 private farms, 20 varieties being used. Minnesota 23 grown at Guyra gave the maximum yield of 61.3 bushels per acre. A limited number of manurial trials were carried out.—*L. R. Waldron.*

1589. REYNOLDS, MARK H. **Farmers' experiment plots. Potato experiments, 1921-22.** New England district. Agric. Gaz. New South Wales 33: 729-731. 1922.—The experiments were conducted cooperatively with 9 farmers. The variety Factor yielded highest at 8 points. The greatest fertilizer returns were obtained from plots comprising land recently broken from pasture or from land not recently cropped to potatoes. Plots continuously cropped to potatoes without fertilizer did not respond profitably to fertilizer application.—*L. R. Waldron.*

1590. REYNOLDS, MARK H. **Fodder crops for dairy farmers. Northern tablelands.** Agric. Gaz. New South Wales 33: 725-726. 1922.—The article discusses best fodder crops for the various zones in this district.—*L. R. Waldron.*

1591. RICHTHOFEN, VON. **Bodengare unter Berücksichtigung der Stallmistdüngung.** [Manuring with stable manure.] Mitteil. Deutsch. Landw. Ges. 37: 670-674. 1922.—The author advocates spreading manure in winter on fall-plowed land. The number of soil bacteria is said to have been increased and the yield of potatoes to have been much improved by this method.—*A. J. Pieters.*

1592. ROSSEM, C. VAN. **Bemestings-, nawerkings- en vruchtwisselingsproeven op Java en ter Oostkust van Sumatra.** Verslag over den Westmoesson 1918-1919. [Fertilizer, fertilizer after-effect, and crop-rotation tests in Java and the East Coast of Sumatra. Report for the west monsoon 1918-1919.] Dept. Landb. Nijv. en Handel [Nederland.-Indië] Alg. Proefsta. Landb. Mededeel. 5. 109 p. 1920.—Pages 9-16 summarize the results of these tests. The remainder of the publication is devoted to a detailed description of the same tests.—*Carl Hartley.*

1593. ROSSEM, C. VAN. **Bemestings-, nawerkings- en vruchtwisselingsproeven op Java en Sumatra.** Verslag over den Westmoesson 1919-1920. [Fertilizer, fertilizer after-effect, and rotation tests in Java and Sumatra. Report for 1919-1920.] Dept. Landb. Nijv. en Handel [Nederland.-Indië] Alg. Proefsta. Landb. Mededeel. 10. 119 p. 1921.—This article gives tests of commercial fertilizers, stable manure, and green manures on rice. In addition 6 fertilizer tests with potatoes and 1 with corn are reported; also 5 rotation experiments. A general survey of the results is given in pages 9-16.—*Carl Hartley.*

1594. ROSSEM, C. VAN. **Bemestingsproeven in den proeftuin.** Verslag over het jaar 1918, tevens samenvatting van de resultaten met die der voorafgaande jaren. [Fertilizer experiments and report for 1918 together with a summary of the results of previous years.] Dept. Landb. Nijv. en Handel [Nederland.-Indië] Alg. Proefsta. Landb. Mededeel. 2. 41 p. 1919.—Extensive comparisons are made of various artificial manures with regard to their effect on the production of rice. In 6 tests calcium nitrate had about the same effect as ammonium sulphate while both were more favorable than Chili saltpeter. Sulphuric acid appeared to have no influence on rice production. Calcium carbonate increased the yield. Chili saltpeter and ammonium sulphate were compared in production of cassava and the results showed that the former used singly or in combination with superphosphate gave the highest yields.—*R. D. Rands.*

1595. ROSSEM C. VAN. **Bemestingsproeven in den proeftuin.** Verslag over het jaar 1919. [Fertilizer tests in the experimental grounds. Report for the year 1919.] Dept. Landb. Nijv. en Handel [Nederland.-Indië] Alg. Proefsta. Landb. Mededeel. 6. 31 p. 1921.—Experiments at Buitenzorg are reported. The addition of sulphuric acid 5 successive times on the same field, in quantities equivalent to 270, 540, and 740 pounds of ammonium sulphate per acre, has failed to show any definite effects on rice production. With superphosphate 3 or 4 applications, and with ammonium sulphate 4 applications, were more advantageous than the same amounts of these fertilizers added in a smaller number of applications. Calcium carbonate increased rice production. Three years' tests indicate that for cassava, Chili nitrate, either alone or with phosphates, is more valuable than ammonium sulphate used in the same way.—*Carl Hartley.*

1596. RUSSELL, G. A. Peppermint on muck soil. Jour. Amer. Peat Soc. 15⁴: 15-22. 1922.—Peppermint is successfully grown on muck soils in Indiana and Michigan.—G. B. Rigg.

1597. SCHEUERMANN, R. Zur Frage der Ringelkletten in deutschen Wollen. [On the question of bur clovers in German wool.] Mitteil. Deutsch. Landw. Ges. 37: 572-573. 1922.—The author points out that introduced plants do not establish themselves in Germany. *Xanthium spinosum* is said to have entirely disappeared from the vicinity of Döhren during the war when the supply of foreign wool was cut off. The author suggests that pollinating agents are wanting because fertile seed are seldom found on the weeds introduced with wool. Several species of *Medicago*, especially *M. minima*, are mentioned as having been found near wool-cleaning factories. The distribution of this species in Germany is given and it is concluded that there is no danger of this plant becoming a serious pest.—A. J. Pieters.

1598. SCHULTZE, ERNST. Die Zerrüttung der Weltwirtschaft. [The break down of world trade.] 370 p. W. Kohlhammer; Stuttgart, 1922.—Agricultural interests are barely touched upon in the discussion of raw materials. The author is most interested in exchange, railway and steamboat matters, coal, petroleum, industry in general, and trade balances.—A. J. Pieters.

1599. SNELL, K. Die Gruppierung unserer Kartoffelsorten nach bestimmten Typen. [The grouping of our potato varieties according to certain types.] Mitteil. Deutsch. Landw. Ges. 37: 445-446. 1922.—The grouping of varieties by stem and foliage characters is very difficult; a few examples are given. A grouping by tubers has been carried out under the auspices of the Deutsche Landwirtschafts Gesellschaft. In 1914, Schifftan in his "Almanac" made such a grouping, and the present writer in Heft 5 of Arbeit. Forschungsinst. Kartoffelbau has grouped the newer varieties, utilizing the following characters: (1) color of skin (white or colored); (2) color of flesh (white or yellow); (3) form of tuber (round or long); (4) color of light sprout (green, red, or blue violet); (5) color of flower (white, red, or blue violet).—A. J. Pieters.

1600. SNODGRASS, M. D. Report of work at Fairbanks station. Rept. Alaska Agric. Exp. Sta. 1920: 36-48. Pl. 4-5. 1922.—A drought following the dry season of 1919 was severely felt. Romanow and Chogot wheats grown on land that produced 30 and 27 bushels per acre in 1919 produced 6 and 4 bushels respectively. Five other varieties of wheat were grown in test plots. Average yield of wheat on farms in the vicinity was about 15 bushels. Report is made on tests of oat and barley varieties. Buckwheat was a success. Peas were grown for seed, grain for hay. Fourteen varieties of potatoes averaged 82 bushels per acre. Yield of root crops was light. Alfalfa and red clover wintered well being protected by a heavy snowfall. Except red currants, native fruits were abundant. Red raspberries and hybrid strawberries were grown. More than 15 tons of seed grain were distributed among the farmers, mostly by sale or agreement. Cooperative work was carried on.—J. P. Anderson.

1601. STAPLEDON, R. G., R. D. WILLIAMS, KATHLEEN SAMPSON, and T. J. JENKINS. Preliminary investigations with herbage plants. Rept. Welsh Plant Breeding Sta. Univ. Coll. of Wales Aberystwyth 97 p. 1922.—This report covers the results of 3 years' trials with alfalfa, clovers, vetches, and various grasses; growth being discussed under the periods awakening, zenith, gradually waning, rapidly waning, and death. For each species the authors discuss the factors, such as previous cutting, that influence the amount of growth during each period. From a study of flowering in the fall of the seeding year, the authors conclude "that of the species capable of producing heavy Autumn Bites, it is those strains which develop numerous flowering shoots in the seeding year that are most to be desired." Under the heading "Potentiality and Nationality" are reported the success or failure of many species of exotic grasses and legumes, especially clovers, with notes on their probable usefulness in Wales. Notes on fungus diseases are given under each group. Species already more or less widely used in Britain are discussed at greater length, with notes on parasites. The species subject to more exhaustive investigations at Aberystwyth are cocksfoot (*Dactylis glomerata*), Italian and peren-

nial rye grass, a hybrid called "perenital" (*Lolium perenne* \times *L. italicum*), timothy, and tall oat grass. The discussion of the "cocksfoot" and of the rye grasses is especially full, covering the behavior of various strains and nationalities. The author finds that plants of cocksfoot fall into 4 fairly natural growth groups: "dense," "open," "pasture," and "hay." Under clovers, white and red clovers are extensively discussed. The behavior of varieties such as wild white and red clover of various nationalities is reported. In both early and late groups the English red clover gave highest yields, with Chilean 2nd and Canadian 4th. Italian clover proved the most susceptible to anthracnose (*Gloeosporium caulivorum*). There is further a discussion of cyanophoric tests with seedlings and plants of white clover, with reference to the literature. Seed production tests of cocksfoot, perennial rye grass, and timothy are reported. Studies were made and results reported of cross and self-pollination in meadow foxtail, sweet vernal, fine leaved fescues, timothy, rough stalked meadow grass, perennial rye grass, and cocksfoot.—*A. J. Pieters*.

1602. STIEGER. *Unsere Pflicht in der Brotversorgung*. [Our duty regarding the bread supply.] Mitteil. Deutsch. Landw. Ges. 37: 556-557. 1922.—The author points out that 80-90 per cent of the food value of grains fed to cattle is lost and advocates a more complete use of food grains for direct human consumption.—*A. J. Pieters*.

1603. THATCHER, L. E. Corn and soybeans for silage. Ohio Agric. Exp. Sta. Monthly Bull. 7: 79-81. 1922.—In tabular form accompanied by brief explanation yields of silage from corn alone and from the combination of corn and soy beans in the same hill are given; also drilling and checking methods are compared. Suggestions are made regarding the most advantageous time and method of planting.—*R. C. Thomas*.

1604. THATCHER, L. E. Sunflowers for silage in Ohio. Ohio Agric. Exp. Sta. Monthly Bull. 7: 43-49. 1922.—From the data presented conclusions are not warranted; yet there are indications that in Ohio sunflowers cannot compete with corn for silage. In tabular form are given a comparison of sunflowers and Blue Ridge corn for ensilage, of sunflowers versus corn in drills and hills, a comparison in pounds per acre of dry matter based on a 3-year average yield, also an analysis of fresh cut sunflowers, sunflower silage, and corn silage at the Ohio Experiment Station. The article also includes estimates by a number of farmers who have cooperated in determining the relative value of the 3 forms of ensilage.—*R. C. Thomas*.

1605. THATCHER, L. E. Wheat, cultural notes. Ohio Agric. Exp. Sta. Monthly Bull. 7: 139-143. 1922.—The author discusses important cultural features, such as rate of seeding, date of seeding, and preparation of seed bed. The discussion is supported by tables showing the result of experimental work.—*R. C. Thomas*.

1606. THOMAS, GEORGE. The development of institutions under irrigation; with special reference to early Utah conditions. xi+293 p. Macmillan Co.: New York and London, 1920.—The author discusses the development of irrigation institutions in Utah and undertakes to show how the Mormons coped with the institutional problems of irrigation. Of the first canals the smaller were individual or partnership affairs but the larger were community or cooperative undertakings, which when completed were controlled by a watermaster elected by the people. Soon after the settlement of the territory the legal control of the canal was given to the county courts and later to the county selectmen. Numerous cases tried before the county courts, district courts, and supreme court are cited and discussions given. Various legislative features bearing on irrigation such as the Carey Act and the Reclamation Act are discussed in detail. Considerable attention is given to the development of some of the larger projects within the state.—*H. L. Westover*.

1607. THOMPSON, G. E., and C. J. WOOD. Growing cotton in Arizona. Arizona Agric. Exp. Sta. Bull. 90. 265-275. 1919.—This general discussion refers primarily to American Egyptian cotton.—*Herbert C. Hanson*.

1608. THORN, C. E. Fertilizing the wheat crop in Ohio. Ohio Agric. Exp. Sta. Monthly Bull. 7: 112-121. 1922.—The experiments reported cover all the principal Ohio soil types, and several of the trials have been continued sufficiently long to cover a full cycle of climatic change. On every soil in Ohio where wheat is grown in a rotation of clover, profitable returns will doubtless be realized from a moderate dressing of acid phosphate. On the average soil, muriate of potash will give more than sufficient increase to cover its cost, although there are exceptions, and on a few soils nitrate of soda may be used at a profit provided the demand of the soil for phosphorus has been supplied.—*R. C. Thomas.*
1609. TORNAU, OTTO. Ein Versuch über den Einfluss der Kornschwere des Saatgutes auf den Ertrag bei Hafer. [An experiment on the influence of the weight of seed upon the yield in oats.] Jour. Landw. 69: 205-213. 1921.—The results show that yields were about the same whether large or small grains were planted. On the other hand, the large grains showed superiority in development of the growing plant.—*F. M. Schertz.*
1610. WEBER, HERMANN. Die praktische Kartoffelzüchtung in Kovarce und Udvarnok (Slowakei). [Practical potato breeding in Czechoslovakia.] Oesterr. Zeitschr. Kartoffelbau 2: 21-24. 1922.—The production of new strains and varieties by selection and by hybridization is discussed, and an outline of the author's procedure in producing cross bred seed and care of seedlings and the selection and testing of the latter is given. By transplanting seedlings twice before setting in the field they develop larger root systems. It is stated that by this treatment 1-year seedlings attain size and yield comparable to those of plants grown from tubers.—*F. Weiss.*
1611. WENHOLZ, W. Soil improvement for maize. Part I. Manures and fertilizers. New South Wales Dept. Agric. Farmers' Bull. 134. 36 p. 1920. [See Bot. Absts. 7, Entry 60.]
1612. WENHOLZ, H. The cultivation of maize. New South Wales Dept. Agric. Farmers' Bull. 125. 43 p., 13 fig. 1919.—This bulletin describes in popular manner the preparation of the soil, planting, and after cultivation and treatment. Varieties of maize are not discussed. Desuckering a crop at Bathurst resulted in a loss of 21 bushels of grain per acre over the control. Detasseling to increase yield is not recommended. "Topping" of maize (removal of the stalk above the cob for the fodder after the grain has begun to set) is not regarded as an economical practice.—*L. R. Waldron.*
1613. WHITE, W. T. Report of work at Kodiak station. Rept. Alaska Agric. Exp. Sta. 1920: 53-63. 1922.—Reports are given on grains and forage plants which are being grown for silage, etc. None of the crops did as well as usual. Silage is also made of sedge (*Carex cryptocarpa*) with small admixture of beach rye (*Elymus mollis*). Between 60 and 65 tons of hay were made from native bluetop (*Calamagrostis Langsdorfii*). Grimm alfalfa, yellow flowered alfalfa (*Medicago falcata*), sweet clovers (*Melilotus alba* and *M. officinalis*), red clover, vetch (*Vicia sativa*), rape, and Canada field peas were grown but did not do well, due largely to an excessive number of cool, cloudy days.—*J. P. Anderson.*
1614. WILLARD, C. J., and H. L. BORST. Scarifying Ohio sweet clover. Ohio Agric. Exp. Sta. Monthly Bull. 7: 62. 1922.—Although it is claimed that Ohio sweet clover seed does not require scarifying, the authors report excellent results with the Ames huller and scarifier. Samples originally germinating at the rate of 31-90 per cent containing from 1 to 43 per cent hard seed before scarification, averaged 81 per cent of germination afterwards. These results were further verified in field tests.—*R. C. Thomas.*
1615. ZIELSTORFF, W. Über Zusammensetzung und Futterwert von eingesäuertem Kartoffelkraut. [On the composition and feeding value of ensiled potato herbage.] Mitteil. Deutsch. Landw. Ges. 37: 693-694. 1922.—Owing to wet weather the herbage on a field of

potatoes grew rank and remained green at the end of September. This herbage was cut and ensiled. Analyses of fresh material and of the silage showed that in the upper layers there was a 38 per cent loss in organic matter and 25 per cent in the lower layers. In feeding tests this silage was used to replace mangels in the standard feed. Potato silage had about the same feeding value as mangels, as shown by total milk production and percentage of butter fat.—*A. J. Pieters.*

BIBLIOGRAPHY, BIOGRAPHY, AND HISTORY

C. W. DODGE, *Editor*

(See also in this issue Entries 1663, 1671, 1789, 1883, 1900, 1963, 2007, 2066, 2074, 2107, 2211, 2218)

1616. ANONYMOUS. Dr. Joel Lunell. *Amer. Midland Nat.* 5: 243-245. *Frontispiece.* 1920.—This reviews the life and significant works, with the names of some of the publications, of this man of very wide interests, including systematic botany.—*Sister M. Ellen.*

1617. ANONYMOUS. Dr. Joseph Trimble Rothrock dead. *Amer. Forestry* 28: 414. 1922.

1618. ANONYMOUS. Franklin B. Hough—a tribute. *Amer. Forestry* 28: 431-432. *Portrait.* 1922.—Notes from the biography of the "Father of American Forestry" are given on the occasion of the centennial anniversary of his birth.—*Chas. H. Otis.*

1619. ANONYMOUS. Obituary notice. *Trans. and Proc. Bot. Soc. Edinburgh* 27: 344-345. 1919.—A brief sketch and appreciation are given of William Brack Boyd (1831-1918), a former president of the Edinburgh Botanical Society.—*Roxana Stinchfield Ferris.*

1620. ANONYMOUS. Referater af fremmed litteratur. [Reference to foreign literature.] *Tidsskr. Planteavl* 28: 176-184. 1922.—This is a collection of abstracts of important foreign agricultural contributions.—*Albert A. Hansen.*

1621. ANONYMOUS. Sir Frederick Moore. *Gard. Chron.* 71: 322-323. 1922.—This article gives an appreciation and brief biographical sketch following Moore's retirement from the directorship of the Royal Glasnevin Botanical Garden.—*P. L. Ricker.*

1622. ANONYMOUS. Scientific activities in the United States; a biologist's view. [Rev. of: CAULLERY, MAURICE. *Universities and scientific life in the United States.* Translated by: WOODS, JAMES H., and EMMET RUSSELL. *xvii + 269 p.* Harvard University Press: Cambridge, Massachusetts; Oxford University Press: London, 1922.] *Nature* 110: 72-73. 1922.—This book "gives a remarkably lucid and sympathetic interpretation of impressions received by the writer during a stay of 5 months in America in 1916, when, as exchange professor of biology at Harvard, he visited many of the principal seats of learning in the United States."—*O. A. Stevens.*

1623. BERNARD, CH., J. J. B. DEUSS, ET AL. Bibliographisch overzicht III. [Bibliographical survey III.] *Dept. Landb. Nijv. en Handel [Nederland.-Indië] Proefsta. Thee Mededeel.* 72. 116 p. 1920.—Seventy-five Dutch reviews of literature of interest in connection with tea culture, which had previously appeared in *Teysmannia*, are classified under culture, diseases and enemies, preparation, and miscellaneous.—*Carl Hartley.*

1624. BISCHOFF, AD. Saatzuchtgenossenschaften. [Seed breeding associations.] *Jour. Landw.* 70: 81-100. 1922.

1625. BOWER, F. O. Obituary notice. *Trans. and Proc. Bot. Soc. Edinburgh* 27: 342-344. 1919.—A brief sketch and appreciation are given of Dr. Robert Chapman Davie (1887-1919).—*Roxana Stinchfield Ferris.*

1626. BROTHERRSON, R. P. *The Manse Garden*. Gard. Chron. 71: 320-321. 1922.—Nathaniel Paterson, author of the *Manse Garden*, was either the grandson or great-grandson of Old Mortality (the subject of a book by Sir Walter Scott) whose real name was Robert Paterson. He was then a minister at Galashiels near Glasgow. The *Manse Garden*, published anonymously, was very popular, and was written to stimulate garden cultivation. Several quotations from the book on garden procedure are given and comments are made regarding the work.—*P. L. Ricker*.
1627. C[OHEN] S[TUART], C. P. *De legende van het ontstaan der theeplant*. [The legend of the origin of the tea plant.] De Thee 1: 83-85. 1 fig. 1920.—A Dutch translation is given of the Latin account by Engelbrecht Kaempfer (*Amoenitates exoticæ*, Lemgo, 1712) of the legend of the origin of the first two tea bushes from the amputated eyelids of an Indian ascetic. The supposed connection with eye lids was believed by the Jaapnese to explain the effect of tea in preventing sleepiness. This is explained as a case of the signature doctrine.—*Carl Hartley*.
1628. GAGER, C. STUART. *Historical note concerning the Brooklyn Hunt Botanical Garden*. Brooklyn Bot. Gard. Rec. 11: 118-121. 1922.—Quotations are given from the "Second annual address delivered before the Brooklyn Horticultural Society," by the president, John W. Degrauw, Esq., Dec. 6, 1855. The quotations give information (in addition to that given in Brooklyn Bot. Gard. Rec. for October, 1918) concerning the attempt to establish in Brooklyn "The Hunt Botanical Garden," and the complete failure of the plans.—*C. S. Gager*.
1629. GAGER, C. STUART. *The first "botanic" garden in Brooklyn*. Brooklyn Bot. Gard. Rec. 11: 115-118. 1922.—An account is given of the "Horticultural and Botanic Garden of Brooklyn," established in Brooklyn, New York in 1825 by André Parmentier, who came to Brooklyn from Belgium. André Parmentier was a relative of Anthony Parmentier, who is said to have introduced the potato into France. This early Brooklyn garden had an area of 25 acres and offered for sale the surprising number of 242 kinds of apples, 190 pears, 71 cherries, 64 peaches, 85 plums; also 396 varieties of ornamental trees and shrubs, including 200 varieties of roses. André Parmentier died Nov. 27, 1830.—*C. S. Gager*.
1630. GRIEVE, SYMINGTON. *Obituary notice*. Trans. and Proc. Bot. Soc. Edinburgh 27: 339-342. 1919—This is a sketch and appreciation of Dr. William Watson (1832-1912), president of the Edinburgh Botanical Society from 1897 to 1899.—*Roxana Stinchfield Ferris*.
1631. HAVENHILL, L. D. *The cultivation of medicinal plants*. Trans. Kansas Acad. Sci. 30: 33-39. 1919/21 [1922].—This short historical account calls general attention to a few drugs, including ginseng, mint, hydrastis, camphor, belladonna, digitalis, and echinacea. A plea for the necessity both of cultivation and of interesting people in the subject is included.—*F. C. Gates*.
1632. HEITLAND, W. E. *Agricola, a study of agriculture and rustic life in the Greco-Roman world from the point of view of labour*. x + 492 p. University Press: Cambridge, 1921.
1633. HERTEL, H. *Lensgreve B. Wedell*. Tidsskr. Landokonomi 1922: 493-496. 1 pl. 1922.—This article records the death and life work of Count B. Wedell, one of Denmark's largest landholders and a leading figure in Danish agriculture.—*Albert A. Hansen*.
1634. JENSEN, JOHS. *Beretning fra Statskonsulent Johs. Jensen, Aabenraa*. [Report of state agent Johs. Jensen of Aabenraa.] Tidsskr. Landokonomi 1922: 418-423. 1923.—This report from the government agent stationed in the recovered province Slesvig (Schleswig), returned by Germany to Denmark after the World War, states that under German rule farming in Slesvig was inferior to farming in Denmark, due principally to the fact that the Danes in Slesvig were heavily taxed.—*Albert A. Hansen*.

1635. JEPSON, W. L. *Carex* exploration in California, an historical note. *Erythea* 8: 5-6. 1922.—The history of *Carex* collecting is traced from the date of the earlier expeditions until the present time, with indication of the special region covered by the various collectors.—*W. L. Jepson*.

1636. KRUIF, PAUL H. DE. Jacques Loeb, the mechanist. *Harper's Mag.* 146: 182-190. 1922.—The writer presents a resumé of Loeb's work and an analysis of his methods of thought.—*C. W. Dodge*.

1637. LYONS, H. G. Science in Egypt. *Nature* 110: 283-286. 1922.—The development of the various branches of science in Egypt is briefly reviewed.—*O. A. Stevens*.

1638. MENZIES, DAVID. Dr. Archibald Menzies. *Gard. Chron.* 72: 7. 1922.—Additions are presented to notes published in *Gard. Chron.* Dec. 24, 1921.—*P. L. Ricker*.

1639. MOORE, FREDERICK W. William Watson, V. M. H. An appreciation. *Gard. Chron.* 72: 30. 1922.—This article gives a brief biographical sketch on Watson's retirement as curator of Kew Gardens.—*P. L. Ricker*.

1640. ORR, JOHN. A short history of British agriculture. 96 p., *illus.* Oxford University Press: London. 1922.—This book devotes a chapter to the story of how men became farmers, considers the history of the art of growing grain, and gives briefly the agricultural history of Britain. The rise of the manor system under William the Conqueror, its decline, the establishment of the landlord-tenant system, and the beginning of modern farming are described. The influence of agricultural literature is traced, beginning with the writing of Walter of Henly in the 13th century. The author tells of the establishment of the first Board of Agriculture in 1793, its effect, and the initial step toward giving farmers a scientific education in a systematic way by the employment in 1803 of Sir Humphrey Davy to lecture on agricultural chemistry. The enactment of important agricultural legislation is described. [See also *Bot. Absts.* 12, Entry 1645].—*Mary R. Burr*.

1641. PARKER, JOHN H. A review of literature on the rusts of oats, with notes on their distribution in the United States. *Trans. Kansas Acad. Sci.* 20: 71-118. 1919/21 [1922].—This is an extended review of 52 cited papers, published before 1916, dealing in part at least with the 2 rusts of oats, *Puccinia Lolii* Niels. f. sp. *Avenae* (crown or leaf rust of oats) and *Puccinia graminis* Pers. f. sp. *Avenae* Erikss. and Henn. (black stem rust), to which is added a series of extracts from answers to a questionnaire sent to each state agricultural experiment station and to each cereal field station of the U. S. Department of Agriculture in February, 1916.—*F. C. Gates*.

1642. PAYNE, C. HARMON. The history of the moss rose. A critique. *Gard. Chron.* 72: 49, 69-70, 84, 93, 108, 124, 135. 1922.—Comments are presented on a previous article by Major Hurst [see *Bot. Absts.* 11, Entry 267].—*P. L. Ricker*.

1643. RICHARDSON, A. E. V. The practical value of agricultural education. *Jour. Dept. Agric. Victoria* 18: 577-586. 1920.—This is an account of agricultural education, the experiment stations, and extension work in America with the applications that should be made for Victorian (Australia) conditions.—*Wm. E. Lawrence*.

1644. RIDDELL, WILLIAM. The pharmacopeia of another botanical physician. *Trans. and Proc. Bot. Soc. Edinburgh* 28: 1-23. 1920.—An abstract of *The Vegetable Family Physician* by Samuel B. Emmons (Boston, 1836), a follower of the Thomsonian School of Medicine, is given.—*Roxana Stinchfield Ferris*.

1645. RUSSELL, E. J. The history of British agriculture. [Rev. of: (1) ERNLE. *English farming: Past and present*. 3rd ed., xvi + 504 p. Longmans, Green and Co.: London, 1922.

(2) ORR, JOHN. A short history of British agriculture. 96 p. Oxford University Press: London, 1922 (see Bot. Absts. 12, Entry 1640).] Nature 110: 204-205. 1922.—This edition of the 1st book differs from the previous one in that it contains a chapter on the war farming of 1914-1918. The 2nd book will be very useful to teachers of agriculture.—O. A. Stevens.

1646. SCHRAMM, J. R. The abstracting and indexing of biological literature. Science 56: 495-501. 1922.

1647. SETCHELL, WILLIAM ALBERT. Aboriginal tobaccos. Amer. Anthropol. 23: 397-414. Pl. 3. 1921.—The author has grown seed of tobaccos still in use by various Indian tribes of North America and has studied the geographical distribution of the various species of *Nicotiana*: *N. Tabacum* L. occurring from Brazil to Mexico; *N. rustica* L. used east of the Mississippi River; *N. Bigelovii* (Torr.) Watson and its relatives used in California, Oregon, and North Dakota; *N. attenuata* from Arizona to British Columbia; and *N. trigonophylla* in the Southwest. The author concludes that the distributional evidence points toward an American home for the tobacco plant.—C. W. Dodge.

1648. TONI, G. B. DE. Francesco Baglietto. Nuova Notarisia 33: 32-43. 1922.—This is a biographical and bibliographical sketch of the well-known Italian lichenologist and mycologist and "the last pupil of the illustrious Prof. Giuseppe De Notaris." Baglietto was associated with De Notaris and Cesati in issuing the Erbario Crittogamico Italiano. He was born at Voltri in 1826 and died in Genoa Feb. 24, 1916.—Marshall A. Howe.

1649. WAKSMAN, SELMAN A. Enzymes of microorganisms. Absts. Bact. 6: 265-299, 331-360. 1922.—A bibliographic and historical review is represented with citations to 957 papers bearing on the subject.—D. Reddick.

1650. WALCOTT, C. D. The new building of the National Academy of Sciences, U. S. A. Nature 110: 120-122. 1 fig. 1922.

1651. WALKER, K. C. Bibliography and research. Science 56: 418. 1922.

1652. WIENER, LEO. Africa and the discovery of America. Vol. II. xxiii + 287 p., 27 pl. Innes & Sons: Philadelphia, 1922.—References to the early literature regarding cotton are given, from the inscriptions of Sennacherib to Theophrastus. Philological evidence is presented that cotton originated in Assyria and India and that it was not introduced into Egypt or Europe until the Arabic conquest. The author regards the statements in Pliny, other than those copied from Theophrastus, as largely interpolations of a much later date. The author suggests that if the accounts of Columbus and the early explorers are correct, *Bombax ceiba* rather than *Gossypium* was the plant meant by "cotton." Since Columbus brought seeds of a number of plants on his 2nd voyage, it is probable that he imported cotton, a crop perhaps new to the Indians since they were so reluctant to cultivate it. Most of the native cloth was made from the maguey. Cotton culture in Mexico is discussed in detail with a survey of all available references in 16th century literature. In considering the antiquity of cotton in Peru, the author criticises severely the attempts to base chronology on guano deposits. He suggests that cotton was introduced at the Conquest by the negro overseers. Evidence is given that the presence of cotton in graves is no safe criterion of its antiquity.—In discussing the origin of tobacco, the author quotes widely to show the use of fumigations and smoking in ancient and mediaeval medicine. Smoking for pleasure and the "smoke vender" are discussed historically and philologically. There are presented many references to the cultivation of tobacco in Africa and America, and to its use by the natives, both as a medicine and in pursuit of pleasure. The introduction of *Nicotiana* to Europe and its spread are discussed in great detail. The botanical arguments are carefully presented as are also the archaeological data. The author concludes that tobacco was probably of African origin, and brought to America from the Mandingo country in the centuries immediately before the voyages of Columbus. [See also Bot. Absts. 11, Entry 1075].—C. W. Dodge.

1653. WIENER, LEO. *Africa and the discovery of America*. Vol. III. xxi + 402 p., 41 pl. Innes & Sons: Philadelphia, 1922.

BOTANICAL EDUCATION

C. STUART GAGER, *Editor*

ARTHUR H. GRAVES, *Assistant Editor*

(See also in this issue Entries 1622, 1632, 1637, 1640, 1643, 1645, 1978)

1654. ANONYMOUS. *The Royal Botanic Society's gardens*. *Nature* 110: 185-187. 1 fig. 1922.—This is a brief review of organization and work. The figure is an aerophoto of the grounds.—O. A. Stevens.

1655. ANONYMOUS. *Plant morphology and physiology*. [Rev. of: DIXON, H. H. *Practical plant biology: A course of elementary lectures on the general morphology and physiology of plants*. xi + 291 p. Longmans, Green and Co.: London, 1922.] *Nature* 110: 274-275. 1922.—This book comprises 30 lectures treating a wide range of plant types from unicellular forms to flowering plants. Outstanding features are the interest and charm of the author's style, and the wide use of data from physics and chemistry.—O. A. Stevens.

1656. ANONYMOUS. [Rev. of: SKENE, M. *Common plants*. (Common Things Series.) 271 p. 28 pl. Andrew Melrose: London, no date.] *Nature* 110: 177. 1922.—This book is said to be a very readable account of the various problems and achievements of plant study. [See also Bot. Absts. 11, Entry 1085.]—O. A. Stevens.

1657. BÜNGER. *Die Ausbildung des Landwirtschaftslehrers*. [The training of agricultural teachers.] *Jour. Landw.* 70: 101-108. 1922.

1658. CLUTE, WILLARD N. *Botany for beginners III*. *Amer. Bot.* 28: 102-106. 1922.

1659. CLUTE, WILLARD N. *Botany for beginners VI*. *Amer. Bot.* 28: 155-158. 1922.

1660. CLUTE, WILLARD N. *Plant names and their meanings-XII. Labiatae*. *Amer. Bot.* 28: 115-123. 1922.

1661. CLUTE, WILLARD N. *Plant names and their meanings-XIII. Labiatae-II*. *Amer. Bot.* 28: 145-153. 1922.

1662. DAVIS, W. H. *The teaching of plant pathology*. *Proc. Iowa Acad. Sci.* 27: 81-84. 1920.—Plant pathology is a comparatively new subject about which very little is known by the general public. The public schools should educate children along this line. The course should be concerned with little about many parasites rather than much about few. Definite objects or questions should be given the student in laboratory and definite summaries or conclusions should be required.—H. S. Conard.

1663. HUBER, W. A. *Die Staatsförsterschule in Ort bei Gmunden*. [The state forestry school at Ort near Gmunden.] *Wien. Allg. Forst u. Jagd Zeitg.* 40: 37-38. 1922.—An Austrian state boarding school of forestry, having a capacity of about 50 students, is now in operation near Gmunden. Sons of foresters only are accepted. The project was started in 1910 under the patronage of Emperor Franz Joseph. It was barely under way when interrupted by the war. It has now been revived with a membership of 38 students (125 applicants).—F. S. Baker.

1664. JAMES, J. A., and A. A. WIPPERMAN. *Science in Wisconsin high schools*. *School and Soc.* 16: 367-371. 1922.—This is an investigation of the changing status of the sciences in the high schools with particular reference to change in enrollment.—W. L. Eikenberry.

1665. PAGE, JOHN C. *Biology: its educational value socially considered.* Education 42: 585-604. 1922.

1666. SCHÖNWIESE. *Die Ausbildung der Staatsförster.* [The training of government foresters.] Wien. Allg. Forst u. Jagd Zeitg. 40: 56. 1922.—Comments are made on criticisms brought by the State Foresters Association defending the adequacy of the instruction at the new forest school at Ort near Gmunden.—*F. S. Baker.*

1667. SEEDORF, W. *Zur Frage des Hochschulunterrichts in der landwirtschaftlichen Betriebslehre.* [Concerning advanced instruction in agricultural teaching.] Jour. Landw. 70: 163-170. 1919.

1668. TAGG, HARRY F. *The preservation of artificial cultures of moulds.* Trans. and Proc. Bot. Soc. Edinburgh 27: 335-337. 1919.—Cultures of moulds killed by formalin vapor may be preserved for class use by (1) sealing the Petri dish in those cultures that do not liquefy the medium, and (2) melting the medium in water and floating the culture upon a glass plate which can later be sealed with a watch glass and cemented with a small amount of preserving fluid consisting of equal parts of formalin, glycerin, and water under the glass to insure a life-like appearance. The latter method is much better than drying the cultures upon cards.—*Roxana Stinchfield Ferris.*

ECOLOGY AND PLANT GEOGRAPHY

H. C. COWLES, *Editor*

GEO. D. FULLER, *Assistant Editor*

(See in this issue Entries 1547, 1560, 1597, 1697, 1699, 1721, 1846, 1878, 1889, 1933, 1940, 1941, 1946, 1949, 2005, 2124, 2211, 2218)

FOREST BOTANY AND FORESTRY

J. S. ILLICK, *Editor*

(See also in this issue Entries 1545, 1663, 1666, 1843, 1880, 2050, 2053, 2077, 2132, 2133)

1669. ANONYMOUS. *Big tree contest.* Brooklyn Bot. Gard. Rec. 11: 124. 1922.—From 300 records received it was ascertained that probably the largest tree on Long Island is a sycamore (*Platanus occidentalis*) at Wheatley Hills, 24 feet in circumference; the next largest a white oak (*Quercus alba*), at Stony Brook, 19 feet, 17 inches in circumference; and the third largest a sycamore, at St. James, 18 feet, 4 inches.—*C. S. Gager.*

1670. ANONYMOUS. *Forest fires worst in six years.* Amer. Forest. 28: 540-541. 1922.

1671. ANONYMOUS. *Forest products laboratory, Madison Wisconsin.* U. S. Dept. Agric. Dept. Circ. 231. 47 p. 1922.—A brief account is given of its work and aims.—*L. R. Hesler.*

1672. ANONYMOUS. *Government forest work.* U. S. Dept. Agric. Dept. Circ. 211. 47 p. 1922.—This is a popular treatise on the beginning of government forest work, national forests, protection, cooperation with the states, research, publications, etc.—*L. R. Hesler.*

1673. ANONYMOUS. *Important forest trees of the eastern United States.* U. S. Dept. Agric. Dept. Circ. 223. 11 p. 1922.—This is a key to the common kinds of trees (reprinted from U. S. Dept. Agric. Bull. 863) and a table with remarks giving the names and range of 100 important eastern forest trees.—*L. R. Hesler.*

1674. ANONYMOUS. *Preserve the national parks.* Canadian Field Nat. 36: 51-52. 1922.—The public should be kept informed of apparently innocent commercial projects which may be used for the fullest exploitation of the natural resources of parks.—*W. H. Emig.*

1675. ANONYMOUS. Redogörelse för Verksamheten vid Statens Skogsförsöksanstalt under år 1920. [Annual report of the activities of the Swedish forest experiment station, 1920.] Meddel. Statens Skogsförsöksanst. 18: 329-340. 1921.—The activities of the various departments are discussed by their respective heads, as follows: Forest management, GUNNAR SCHOTTE, Director; natural science, HENRIK HESSELMAN; forest entomology, IVAR TRÄGÅRDH; natural reproduction in Norrland, EDVARD WIBECK. The report is followed by a similar one covering the year 1921.—*G. A. Pearson.*

1676. ANONYMOUS. Silvicultural notes. Indian Forest. 48: 401-404. 1922.—Natural regeneration of Haldū, *Adina cordifolia*, was secured only after heavy cutting and slash fires and did not follow any cutting without the aid of fire. A very brief annotated yield table for 4 sites of sal in the United Provinces is given, the site classes being based on average height of dominant trees.—*E. N. Munns.*

1677. ANONYMOUS. Tests with silver fir for use as sleepers. Indian Forest. 48: 316-327. 1922.—Wood tests of *Abies pindrow* with American Douglas fir (*Pseudotsuga taxifolia*) show that there is little difference in the strength or character of the woods. Durability tests have not yet been run.—*E. N. Munns.*

1678. ANONYMOUS. The national forests of New Mexico. U. S. Dept. Agric. Dept. Circ. 240. 21 p., 7 fig. 1922.

1679. ANONYMOUS. Trade names for Indian timber. Indian Forest. 48: 135-141. 1922.—A list of the accepted common names is given for 145 Indian timber species.—*E. N. Munns.*

1680. ANONYMOUS. Your national forests. Amer. Forest. 28: 276-277. 1922.—This editorial briefly summarizes the national forest resources of the U. S. A., their extent, value, yield in lumber, and relation to grazing, water power, and recreation.—*Chas. H. Otis.*

1681. ANONYMOUS. [Rev. of: GAMBLE, J. S. A manual of Indian timbers; an account of the growth, distribution, and uses of the trees and shrubs of India and Ceylon, with descriptions of their wood-structure. Reprint of 2nd ed. with some additions and corrections. xxvi + 868 p., 20 pl. Sampson Low, Marston and Co.: London, 1922.] Nature 110: 276. 1922.

1682. ANONYMOUS. [Rev. of: STONE, HERBERT. A guide to the identification of our more useful timbers: Being a manual for the use of students of forestry. viii + 52 p., 3 pl. University Press; Cambridge, 1920]. Nature 110: 276. 1922.—[See also Bot. Absts. 7, Entry 764; 11, Entry 10.]

1683. ANONYMOUS. [Rev. of: STONE, HERBERT. A text-book of wood. vii + 240 p., 41 pl. Rider and Son: London, 1921.] Nature 110: 73-74. 1922.—This book is intended for advanced students. It contains some good photographs of wood structures, but many errors of various kinds.—*O. A. Stevens.*

1684. ASHE, W. W. The creation of the eastern national forests. Amer. Forest. 28: 521-524. 3 fig., 1 map. 1922.

1685. BEESON, C. F. C. The beehole borer of teak: a preliminary report on the ecology and economic status of *Duomitus ceramicus* in Burma. Indian Forest Rec. 8: 1-105. Pl. 1-6, diagr. 1-3. 1922.—The beehole borer causes severe losses in growth and in the stand. Vigorous trees apparently are more often attacked than the suppressed stand. The average number of holes per tree is directly proportional to the girth. This is due to the more successful development of the insect larvae with rich food supplies. Fire does not appear to be a controlling agent, but thinnings reduce the attack considerably.—*E. N. Munns.*

1686. BERGER, A. Die Arbeitsteilung der Tayloristischforstlichen Arbeitsgemeinschaft. [The "Taylor System" in forest industry.] Wien. Allg. Forst u. Jagd Zeitg. 40: 55-56. 1922.—The author discusses the principles of the system and urges forest owners to acquire greater familiarity with them.—*F. S. Baker.*

1687. BLANDFORD, H. R. Teak as an even-aged crop. Indian Forest. 48: 429-431. 1922.—Teak should be thinned early to a wide spacing as later it does not respond to changes in growth conditions. This should be reflected in wider spacing at the time of planting and underplanting with other species of commercial value, which as yet have not been tried. Bamboo as an understory does not produce sufficient revenue.—*E. N. Munns.*

1688. BORTHWICK. Forest protection. [Abstract.] Rept. British Assoc. Adv. Sci. 1921: 451. 1921.

1689. BRANDT. Auffrieren von Nadelholzkulturen. [Frost-heaving of planted conifer stock.] Deutsch. Forstzeitg. 37: 494-495. 1922.—Damage to uncovered plants was about 80 per cent; plants covered with needle-straw, moss, and rye chaff all escaped; with a covering of heather, pine, and oak twigs, the loss was about 5 per cent, and with coarse sand 10 per cent.—*W. N. Sparhawk.*

1690. BRODERICK, J. J. England's forestry problem. Amer. Forest. 28: 341-342. 1922.—In this speech by the commercial counsellor of the British Embassy on the occasion of the acceptance of a gift of Douglas fir seed to Great Britain, the forest policy of England is reviewed.—*Chas. H. Otis.*

1691. C., S. "Geimpftes" Holz. ["Inoculated" wood.] Deutsch. Forstzeitg. 37: 464-465. 1922.—Reimann has patented a method for coloring common woods to resemble various cabinet woods and to imitate their grain.—*W. N. Sparhawk.*

1692. CHAMPION, F. W. "La methode du contrôle" for selection forests. Indian Forest. 48: 349-364. 4 graphs. 1922.—The method of control, a management plan, was put into limited practice in Switzerland to produce the greatest value in small quantities of material of highest value. The basis is a study of the diameter growth during the entire life of the stand as an indication of its growth and health. Theoretically the method is an ideal form of management, but it is impossible in practice on any but very small areas and then only by well trained foresters.—*E. N. Munns.*

1693. CHAMPION, F. W. The femelschlag system or the system "by coupes jardinatoires." Indian Forest. 48: 115-127. 5 fig. 1922.—This system is used in mixed forests of beech, spruce, and fir where the age classes are unevenly distributed and where there is no definite felling cycle. In effect is a thinning rather than a cutting, releasing reproduction and advance growth whenever necessary, and securing high quality wood. The chance of failure in securing reproduction is minimized, the method is elastic, and is adapted to tolerant trees.—*E. N. Munns.*

1694. CHAMPION, H. G. Note on the death of chir (*Pinus longifolia*) poles in the Almora plantations of Kumaon. Indian Forest. 48: 168-173, 232-246. Pl. 9. 1922.—Extensive dying off of chir in plantations has made it imperative to combat this death rate. The high mortality nullifies attempts to complete stocking of poorer areas, for in 3 years' time 25 per cent of the dominant trees were killed. Control measures recommended are the removal of suspected trees and the burning of all resulting debris.—*E. N. Munns.*

1695. CHAPMAN, H. H. Forest mensuration. xxi + 553 p. John Wiley and Sons: New York; Chapman and Hall, Ltd.: London, 1921.—This text book is a successor to Graves' Forest Mensuration. It discusses the measurement of the volume of felled timber; the meas-

urement of standing timber; and the growth of trees, forest stands, and forests. Part 1 shows the relation of the cubic contents of logs and other measurement to the contents as expressed in terms of products. Part 2 presents a complete analysis of the art of timber estimating as practiced in every timber region of the U. S. A. Part 3 aims to systematize the principles and problems that are encountered in studying tree growth. The book contains 89 tables. A 10 page appendix on lumber grades and rules follows the text and a 13-page appendix on the measurement of piece products outlines practical suggestions.—[See also Bot. Absts. 12, Entry 398.]-T. C. Harbeson.

1696. CHEYNEY, E. G. The passing of an industry. An epic of the great American forest. Amer. Forest. 28: 323-338. 24 fig., 1 map. 1922.—A popular résumé is presented of timber resources and logging industries in the U. S. A. and their historical background from the time of the landing of the Pilgrims to the present day.—Chas. H. Otis.

1697. COOPER, H. L. Notes on some Assam rain forests. Indian Forest. 48: 131-132. 1922.—The rapid rate of decay and the weight of the climbers aiding in breakage and wind-falls are thought to be the reasons why trees in rain forests do not attain great size.—E. N. Munns.

1698. CRIDDLE, NORMAN. The relation of wild life to agriculture. Canadian Field Nat. 36: 47-49. 1922.—With the advent of civilization, followed by cultivation, the natural balance became changed. A restoration of the former balance might be accomplished by the establishment of wild life sanctuaries and the planting of trees and berry-bearing shrubs near farm buildings.—W. H. Emig.

1699. CUNLIFFE, N. Height growth of trees. Quart. Jour. Forest. 16: 274-275. 1922.—Vigorous young trees averaging 2½ m. were measured every 2 weeks for height growth during the summer of 1921 to determine effect of climatic factors. Corsican pine and western yellow pine (*Pinus ponderosa*) grew most rapidly at the end of May; Sitka spruce, Douglas fir, and lowland white fir (*Abies grandis*) in the latter part of June. Growth of all these species started the end of April and ceased in July or early August. In European and Japanese larch the whole growth period was 2-4 weeks later than in the other conifers, and growth was more regularly distributed over the whole period. Beech differed markedly from the conifers in that it grew very rapidly during May and only slowly during June and the early part of July. The maximum daily increment of the most vigorous trees, varied from 4.7 mm. for western red cedar (*Thuja plicata*) to 33.5 mm. for beech. The former showed a slight winter growth and also a small growth of the previous year's shoots. In Corsican pine and Sitka spruce temperature was more important than all other factors combined in determining fluctuations in growth rate. The same was true for larch when the mean shade temperature did not rise about 66°F., above 66 growth was depressed. An increase in mean air temperature during the entire growing period decreases the annual growth of Corsican pine while a rise in the mean daily temperature increases the daily increment. Annual increment proved inversely related to mean soil temperature at the 6-inch depth for May and June. Rainfall of the growing period appeared more important than that of the previous winter.—C. R. Tillotson.

1700. DINGLER, MAX. [Rev. of: STELLWAAG, F. Die Schmarotzerwespen (Schlupfwespen) als Parasiten. (The parasitic wasps.) Beih. Zeitschr. Angew. Entomol. No. 6. 1921.] Forstwiss. Centralbl. 44: 32-34. 1922.—This is the first comprehensive biological treatise on a group of insects very important in agriculture and forestry. The author includes in the group all those insects—8 families and certain species of 2 others—which show true parasitism.—W. N. Sparhawk.

1701. EBERHARD, J. Der Schirmkeilschlag und die Langenbrander Wirtschaft. [The shelterwood-wedge cutting and the Langenbrand method.] Forstwiss. Centralbl. 44: 41-54, 103-109, 137-150. 5 fig. 1922.—The author discusses his system of silviculture and replies to

criticisms by C. Wagner. The essentials of the method are: (1) light cuttings over the whole area to secure reproduction of tolerant species, followed at frequent intervals by other light cuttings to keep the young growth in good condition; (2) gradual removal of mature timber by wedge-shaped cuttings, which are enlarged a little each year until the whole area is covered. The article is accompanied by a bibliography of 30 titles.—*W. N. Sparhawk.*

1702. ECKSTEIN. *Der Buchenspringrüsselkäfer Orchestes fagi und seine wirtschaftliche Bedeutung.* [The beech weevil, *Orchestes fagi*, and its economic significance.] Deutsch. Forstzeitg. 37: 435-437. 1922.—The life history and habits of this leaf-eating beetle are discussed. Although attacking only beech in the forest, outside the forest it eats several cultivated trees and crops. The leaves, punctured along the midrib for the deposition of eggs, exude a "leaf honey" sought by bees.—*W. N. Sparhawk.*

1703. ESCHERICH, K. [Rev. of: DECOPPET, M. *Le haneton. Biologie, apparition, destruction.* (The May beetle.) 130 p., 5 charts, 42 maps. Lausanne and Geneva, 1920.] Forstwiss. Centralbl. 44: 74-76. 1922.—Decoppet's monograph contains much valuable information about the May beetle in Switzerland, especially regarding control methods. He believes that the differences in period of development of the beetle in different localities are due to hereditary characteristics rather than to climatic factors. This theory is directly opposed to the views of others, especially Zweigelt.—*W. N. Sparhawk.*

1704. EYSEL, JOH. *Der erste österreichische Almwirtschaftstag und der Weidwald.* [Alpine agriculture and grazing forests.] Wien. Allg. Forst u. Jagd Zeitg. 40: 61-62. 1922.—Present economic conditions make alpine grazing an important business. It is leading to the destruction of high altitude forests. The importance of maintaining a forest cover is recognized. Legal difficulties are in the way of a proper combined grazing and forest management. Present law recognizes only grazing lands (alpine meadows) and timberlands, and not a combination.—*F. S. Baker.*

1705. FABRICIUS, L. *Holzartenzüchtung.* [Breeding of forest trees.] Forstwiss. Centralbl. 44: 86-103. 1922.—Some attention is now given to the selection of seed adapted to sites where it is to be grown. The principles and methods of plant-breeding are briefly outlined, and the possibility of applying the same methods to developing new strains of tree species is discussed. The author regards this as a promising field for research.—*W. N. Sparhawk.*

1706. FABRICIUS. [Rev. of: ANDÉS, LOUIS EDGAR. *Die technischen Vollendungsarbeiten der Holz-Industrie.* (The technique of finishing wood.) 6th ed., 253 p., 54 fig. Vienna and Leipzig, 1920.] Forstwiss. Centralbl. 44: 38-39. 1922.—This book full of helpful suggestions on how to polish, color, and otherwise finish woods for use in furniture and decorative work, is extremely important to German wood-working industries.—*W. N. Sparhawk.*

1707. FABRICIUS. [Rev. of: GAYER, SIG. *Die Holzarten und ihre Verwendung in der Technik.* (Kinds of wood and their utilization.) 2nd ed., 278 p., 47 fig. Leipzig, 1921.] Forstwiss. Centralbl. 44: 39. 1922.—This book, written especially for the wood-working industries, covers the structure and identification of wood, chemical composition of wood and bark, technical properties and defects, uses of individual species, and utilization of by-products and wood-waste.—*W. N. Sparhawk.*

1708. FABRICIUS. [Rev. of: THENIUS, GEORG. *Das Holz und seine Destillations-Produkte.* (Wood and products of its distillation.) 3rd ed., 493 p. Vienna and Leipzig, 1921.] Forstwiss. Centralbl. 44: 37-38. 1922.—The book is regarded as an up-to-date work on dry distillation of wood.—*W. N. Sparhawk.*

1709. FEUCHTINGER. Holzfällung und Rodung mit mechanischen Vorrichtungen oder mittelst Springstoffen (Kultursprengungen). [Felling and clearing with mechanical apparatus or explosives.] Wien. Allg. Forst u. Jagd Zeitg. 40: 157-159, 169-171, 175-177, 183. 1922.

1710. GLASSON, A. K. Regeneration of sal in the low level forests of the Duars. Indian Forest Rec. 84: 1-17. Pl. 1. 1922.—Old methods of regeneration failed to produce successful establishment of sal. By permitting agricultural use of the land and the care and cultivation of the young sal trees in rows or mounds, successful plantations have been established. Two agricultural crops can be raised before the sal interferes.—E. N. Munns.

1711. GROSS, J. Zur Weidezucht. [Basket-willow growing.] Möllers Deutsch. Gärtnerzeitg. 37: 209. 1922.—Willow twigs are in demand for the basket industry. From 1914 to 1918 many plantations were ruined by an excessive demand for baskets for large ammunition. The planting of cuttings of 25 cm. length of *Salix dasyclades*, *S. americana*, and *S. viminalis regalis* is recommended. The soil should be loosened to a depth of 50-60 cm. and the rows planted 50 cm. apart.—J. C. Th. Uphof.

1712. GUTHRIE, J. D. Alaska's interior forests. Amer. Forest. 28: 451-455. 7 fig. 1922.—The forests of interior Alaska are practically confined to the great basins of the Yukon and Kuskokwim rivers. Their area is estimated at 80-150 million acres. The principal trees are white spruce, white birch, balsam poplar, black cottonwood, aspen, black spruce, and tamarack or larch. Of these white spruce is by far the most important. Even with the most careful handling these forests will probably not fully supply the future needs of the country, although the rate of growth is fairly rapid. The species composing the interior forests are admirably suited for pulp. The chief uses of lumber have been for flume and sluice boxes, boat building, and houses and buildings. Considerable loss has occurred through forest fires. Seven items are considered by the writer as a part of any plan for forest protection in interior Alaska.—Chas. H. Otis.

1713. HAWLEY, R. C. The practice of silviculture: with particular reference to its application in the United States. xi + 352 p. John Wiley and Sons, Inc.: New York; Chapman and Hall, Ltd.: London, 1921.—This book treats of silvicultural practices applicable to forest conditions in America. It considers the establishment and development of forest stands, intermediate slash disposal cuttings, and the protection of stands against such destructive agents as fire, insects, fungi, animals, and wind. At the end of each of the 20 chapters appears a list of references, a total of 311. An appendix gives a full list of silvicultural terms and definitions, as compiled by a committee of the Society of American Foresters.—Henry B. Phillips.

1714. HOFINGER, ALOIS. Der Taylorismus in der Forstwirtschaft—die Förderung des Tages. [The "Taylor System" in forestry.] Wien. Allg. Forst u. Jagd. Zeitg. 40: 73. 1922.—This is an appeal for the application of the "Taylor System" (time studies of fundamental motions) in lumbering and forestry.—F. S. Baker.

1715. HOLSTE, GEORG. Fichtenzapfen- und Fichtensamenbewohner. [Insects infesting spruce cones and seed.] Forstwiss. Centralbl. 44: 69-74. 6 fig. 1922.—This is a summary of the results in investigations by Holste, Seitner, and Trägårdh. Of 44 species identified by the author in spruce cones from upper Bavaria, 3 are injurious to seed, 13 to cones, 15 are parasites of these injurious insects, 3 feed on molds and 3 on insects, 3 are mites, 2 are bugs occupying the cones as winter quarters, and the others are accidental. Several of the more important species are described.—W. N. Sparhawk.

1716. HUTCHINSON, W. The eyes of the forest. Amer. Forest. 28: 461-468. 15 fig. 1922.—This article describes the evolution of the fire lookout as developed by the U. S. Forest Service.—Chas. H. Otis.

1717. ILLICK, J. S. The beeches. Amer. Forest. 28: 546-551. 7 fig. 1922.

1718. ILLICK, J. S. The birches. Amer. Forest. 28: 355-364. 18 fig., 1 map. 1922.—This is a popular description of the common birches, their habits, characteristics, and uses.—Chas. H. Otis.

1719. ILLICK, J. S. The white oaks. Amer. Forest. 28: 586-592. 13 fig. 1922.—This is a popular consideration of the common white oaks,—*Quercus alba*, *Q. bicolor*, *Q. macrocarpa*, *Q. minor*, *Q. Prinus*, *Q. Muhlenbergii*, *Q. lobata*, and *Q. Garryana*.—Chas. H. Otis.

1720. KEARNEY, T. H. Tropical forests and their resources in French colonies. [Rev. of: BERTIN, A. Mission d'études forestières envoyée dans les colonies françaises par les ministères de la guerre, de l'armement et des colonies. Vol. I-V. Maps, diagr., illus. Émil Larose; Paris, 1918-1920.] Geog. Rev. 12: 512-513. 1922.

1721. LARSEN, J. A., and C. C. DELAVEN. Climate and forest fires in Montana and Northern Idaho, 1909 to 1919. Monthly Weather Rev. 50: 55-68. 13 fig. 1922.—The region was divided into 7 broad climatic and topographic sections for comparison. The area burned over varies greatly for the various sections, the average ranging from 234 acres in northern Idaho to 100 acres in eastern Montana. The greater hazard is due to differences in climatic conditions, especially rainfall, on the east and west slope of the Continental Divide. The heavy precipitation in Idaho results in a heavy forest, which in the dry period is subject to heavy losses. The most dangerous weather for forest fires occurs at the time of a succession of high pressure areas over the Pacific Northwest. Forest-fire predictions are as yet unreliable, reliance now being placed upon records of current climatic and fire conditions.—E. N. Munns.

1722. LORENZ, HEINRICH. Zollsätze auf die Holzeinfuhr nach Oesterreich für den neuen Zolltarif. [Import duties on wood under the new Austrian tariff.] Wien. Allg. Forst u. Jagd. Zeitg. 40: 127-128. 1922.

1723. MCCALLIE, S. W. Deforestation and erosion. Amer. Forest. 28: 394-396. 3 fig. 1922.

1724. NAGLE, W. Note on shingles made of "Kail" and "Chir" Indian Forest. 48: 328-330. 1 pl. 1922.

1725. NICHOLSON, J. W. Distribution and habit of *Dendrocalamus strictus* and *Bambusa arundinacea* in Orissa. Indian Forest. 48: 425-428. 1922.—The former appears to be confined to a belt with low average humidity in regions where the breezes from the Bay of Bengal are not felt. With increasing humidity, it gradually disappears. Within its range the nature of the soil is the governing factor, the species apparently preferring the physiologically dry soils. Flowering is rather irregular and sporadic, and apparently the tree has been forced from the good to poor soils and sites. *Bambusa arundinacea* prefers the moister sites and better soils, decreasing in importance as drier regions are reached.—E. N. Munns.

1726. NIKODEM. Waldbauliche Betrachtungen. [Forest planting observations.] Wien. Allg. Forst. u. Jagd. Zeitg. 40: 123-124. 1922.—The drought of 1921 caused many plantation failures. Success in dry seasons is best attained by planting carefully in large holes. On slopes the trees should be planted with the short roots toward the hill, and the soil around the tree should be left with an inward tilt to catch and hold water.—F. S. Baker.

1727. PACK, A. N. Fighting avalanches in the Pyrenees. Amer. Forest. 28: 259-262. 8 fig. 1922.—This is a popular description of afforestation methods, as practised by the French and Swiss governments, for the prevention of damage from avalanches and floods.—Chas. H. Otis.

1728. PEARSON, R. S. Results of antiseptic treatment of sleepers. Indian Forest Rec. 9: 1-49. 6 pl., 1 fig. 1922.—After 10 years' testing, the choice of treatment of railroad ties

lies between the Full Cell process using either creosote only or creosote and earth oil together, and Powellizing. The choice between methods is largely one of cost. Further experiments with the Open Cell and Card processes are advocated because of indications. So far, 2 species of *Terminalias*, 3 of *Dipterocarpus*, and 2 of *Pinus* have proved satisfactory. Other woods are being tested.—*E. N. Munns*.

1729. PETERS, J. C. Forest fire protection in Georgia. *Amer. Forest.* 28: 456-459. 5 fig. 1922.—From 1916 to 1921, inclusive, there were reported to the Forest Service 23,000 forest fires, of which 92 per cent resulted from carelessness or from design, and 8 per cent from lightning; 26 per cent were of incendiary origin, 21 per cent from causes unknown, 16 per cent from brush burning, and the remainder were caused chiefly by campers, lumbering, and railroads. About 6,000,000 acres were burned over, causing a money loss to timber and improvements alone of \$5,500,000. Cooperation of federal government and state is suggested for effective fire protection.—*Chas. H. Otis*.

1730. PETRINI, SVEN. Méthode du contrôle. [Method of control.] *Skogsvårdsför. Tidskr.* 19: 249-264. Fig. 1-4. 1921.—The article describes in considerable detail the management of a selection forest in France.—*G. A. Pearson*.

1731. PETRINI, SVEN. Stamformsundersökningar. [Investigations of stem form.] *Meddel. Statens Skogsförsöksanst.* 18: 165-220. Fig. 1-12. 1921.—In this discussion of the form class method of timber estimating the author analyzes the different factors influencing the accuracy of this method and bases his deduction on the results of investigations in stands of Lappland pine. Inaccuracy is apt to result by not getting the correct bark thickness. An ingenious instrument for securing accurate bark measurements is described and illustrated. The graphic methods of determining the average bark thicknesses, form points and form classes are also described and illustrated. Precautions to be taken in the application of this method are pointed out. An English summary is appended.—*Hermann Krauch*.

1732. PEYTON, J. S. State forestry laws of 1921. *U. S. Dept. Agric. Dept. Circ.* 239. 28 p. 1922.

1733. RECKNAGEL, A. B. The future of the American lumber supply. *Amer. Forest.* 28: 611-612. 1922.

1734. RECORD, S. J. Novel trees and forest products. *Amer. Forest.* 28: 481-484. 7 fig. 1922.—The article is popularly descriptive of the royal palm, oyster wood (*Excoecaria lucida*), kiri-gami (*Paulownia*), tree ferns and a peculiar use for them, crotch mahogany, and ash-splint pack baskets.—*Chas. H. Otis*.

1735. RHODES, G. H. Forestry as a business. *Amer. Forest.* 28: 515-520. 5 fig. 1922.—This article discusses the business methods of forest production, taxation, interest charges, etc.—*Chas. H. Otis*.

1736. RICHARDS, E. C. M. West Persia—the wood-famine country. *Amer. Forest.* 28: 579-585. 16 fig. 1922.

1737. RUBNER. Neuere Naturverjüngungsverfahren. [Recent methods of securing natural reproduction.] *Forstwiss. Centralbl.* 44: 1-23. 1922.—Silvicultural methods practised in several mixed forests of spruce, fir, and beech are described. While differing in detail, all emphasize preliminary cutting to secure reproduction and avoidance of conditions which permit sod or dense weeds to occupy the ground and hinder reproduction. Some form of shelterwood cutting over the whole area secures reproduction of the tolerant beech and fir, while strip or border cuttings, normally working from the north or northeast edges, are used to secure the spruce.—*W. N. Sparhawk*.

1738. RUSSELL, P. T. **General notes on nurseries and planting forest trees in the Cinchona plantations.** Mungpoo, Darjeeling District. *Indian Forest*. 48: 224-231. 1 fig. 1922.—Twenty-seven species of native trees have been planted in the past 10 years, and an area of 2,838 acres thus covered. Observations on the care of the trees in nursery and plantations, and methods used, are given.—*E. N. Munns.*
1739. RUSSELL, P. T., L. E. S. TEAGUE, and E. O. SHEBBEARE. **General notes on nurseries and planting in Bengal.** *Indian Forest Rec.* 84: 19-33. Pl. 8-11. 1922.—This summarizes the qualifications of a nursery, nursery practice, and plantings, with notes on 41 Indian species on which some work has been carried out in the nurseries.—*E. N. Munns.*
1740. S. **Die Wäldungen von Jugoslawien.** [Forests of Yugoslavia.] *Deutsch. Forstzeitg.* 37: 425. 1922.—Yugoslavia has 7,500,000 hectares of forest, of which 3,162,700 are state forest. Large forest areas remain undeveloped and lack systematic exploitation. Present production is 22,500,000 cubic feet a year, of which 7,000,000 is conifer timber.—*W. N. Sparhawk.*
1741. S., H. W. **Teak regeneration.** *Indian Forest*. 48: 399-401. 1922.—Few teak seedlings result from sowing in the heavy teak cuttings, planted stock being finally used. Burning and the packing of the soil rather than infertile seed are held responsible for the failure. Instead of planting bare spots, it is suggested that better results might come from dibbling in furrows made during the late spring.—*E. N. Munns.*
1742. SCH. **Die Wälder Polens und Rumäniens.** [Forests of Poland and Rumania.] *Deutsch. Forstzeitg.* 37: 403-404. 1922.—The forest areas of the new Rumania and of the new Poland are given by districts and according to the kind of ownership. For Rumania they are classified as to kind of forest,—conifers, oak, beech, and other hardwoods. As a result of the war Rumania tripled her forest area, which is now 7,308,688 hectares. Poland has 9,770,000 hectares of forest, with an annual growth of 14,000,000 cubic m. of saw-timber and 18,000,000 of firewood, and can export about 6,000,000 cubic m. of logs, or 2-3 million cubic feet of sawed timber.—*W. N. Sparhawk.*
1743. SCHMID, F. **Die Bedeutung des Waldes für den Wasserabfluss und sein Einfluss auf die Geschiebeführung der Wildbäche.** [The significance of the forest in run-off and erosion.] *Wien. Allg. Forst u. Jagd. Zeitg.* 40: 146-147, 152-153. 1922.—This is a popular presentation of the work and results of Engler [see Bot. Absts. 9, Entry 710].—*F. S. Baker.*
1744. SECREST, EDMUND. **Forest planting.** *Ohio Agric. Exp. Sta. Monthly Bull.* 7: 144-151. 1922.—The author discusses salient features of forest planting under the following heads: planting stock, planting site, season for planting, spacing distance, methods of planting, direct seeding, care of planting stock, and care of trees after planting.—*R. C. Thomas.*
1745. SHEBBEARE, E. O. **The taungya system in Northern Bengal.** *Indian Forest Rec.* 84: 8-18. Pl. 2-18. 1922.—The employment of field crops to establish the forest crops is known as taungya. Usually a portion of the forest is clear felled in cold weather, the usable material removed, and the debris burned. Then the villagers sow their crops, among which the forest plants are grown in continuous lines or in planting holes spaced about 6 feet apart. From 2 to 3 agricultural crops are secured, depending on the elevation, species, and location. From 1 to 3 acres of this land supports a household.—*E. N. Munns.*
1746. SOMERVILLE, W. **Buds.** *Quart. Jour. Forest.* 16: 121-127. 1922.—The author discusses physiological characteristics of tree buds.—*C. R. Tillotson.*
1747. SONDEREGGER, V. H. **Boys' reforestation clubs.** *Amer. Forest.* 28: 496-499. 4 fig. 1922.

1748. SPESSIVTSEFF, PAUL. Bidrag till Kännedomen om Splintborrarnas Näringsnag. [Contributions to the knowledge regarding food habits of the European splint beetles (*Eccoptogaster*).] Meddel. Statens Skogsförsöksanst. 18: 315-326. Fig. 1-5. 1921.

1749. SUDWORTH, GEO. B. A new chinquapin. Amer. Forest. 28: 300-301. 1 fig. 1922.—This is a description of *Castanea pumila Ashei* nov. var. a variety of the common chinquapin occurring in the coastal plain of southeastern U. S. A.—*Chas. H. Otis*.

1750. SUTHERLAND, J. Forestry in national and economic aspects. [Abstract.] Rept. British Assoc. Adv. Sci. 1921: 451. 1921.—[See Bot. Absts. 12, Entry 385.]

1751. SYLVÉN, HELGE. Den Skogsteknologiska Forskningen-Erfarenheter och rön från en studieresa i Amerika. [Research in wood technology—notes from a study tour in America.] Skogsvårdsför. Tidskr. 19: 220-246. Fig. 1-9. 1921.—The author has spent 4 years in North America, studying primarily methods of lumbering and utilization. The last year was devoted to a study of technical characteristics and uses of woods. This article outlines the work and organization of the Forest Products Laboratory at Madison, Wisconsin.—*G. A. Pearson*.

1752. THOMAS, C. H. Trees to take the place of those destroyed by chestnut blight. Amer. Forest. 28: 500-501. 1922.—This article mentions chestnut oak, pitch pine, black locust, and other trees which are replacing the chestnut killed by blight.—*Chas. H. Otis*.

1753. TRÄGÅRDH, IVAR. Skogsinsekternas Skadegörelse under 1918. [Damage by forest insects in 1918.] Meddel. Statens Skogsförsöksanst. 18: 282-314. Fig. 1-15. 1921.—The article, accompanied by a German summary, discusses the activities of various insects in Swedish forests.—*G. A. Pearson*.

1754. TROWSCOED. Artificial reproduction. Indian Forest. 48: 287-298, 365-375. 1922.—Observations during the work with the Himalayan conifers result in the conclusions that natural regeneration is always superior to artificial work, that artificial sowing and planting are essential to the complete and rapid stocking of an area, and that reproduction should be secured in the shortest possible time after cutting. General considerations regarding nursery, planting practice, and the subsequent care of plantations are outlined.—*E. N. Munns*.

1755. U. Die Zukunft der Jugoslawischen Wälder. [The future of Yugoslavian forests.] Wien. Allg. Forst u. Jagd Zeitg. 40: 141-142. 1922.—The author covers legal rather than silvicultural aspects and criticizes certain governmental forest regulations and present systems of taxation as fostering short sighted policies.—*F. S. Baker*.

1756. WATERSTON, JAMES. On Chalcidoidea; mainly bred at Dehra Dun, U. P., from pests of sal, toon, chir and sundri. Indian Forest Rec. 92: 1-44. 19 fig. 1922.

1757. WESSLÉN, GÖSTA. Om Träkolsutbytet i Volym vid Milkolning. [Volume yield of charcoal in charcoal burning.] Skogsvårdsför. Tidskr. 19: 206-219. Fig. 1. 1921.—The article deals merely with the volume of product, without going into the technical aspects of the business.—*G. A. Pearson*.

1758. WICKENDEN, H. R. A sketch of Swedish forestry from an American standpoint. Indian Forest. 48: 468-478. 1922.—[See also Bot. Absts. 8, Entry 1048.]

GENETICS

ORLAND E. WHITE, *Editor*

(See also in this issue Entries 1543, 1544, 1575, 1578, 1601, 1609, 1610, 1624, 1705, 1873, 1906, 1911, 1912, 1939, 2018, 2066, 2125, 2126, 2149, 2150, 2172, 2174, 2224)

1759. ANONYMOUS. Method employed by the state domains for producing and maintaining their high standard of Sakel cotton. Min. Agric. Egypt [Unnumbered Circ.] 3 p. 1922.—Methods are described of roguing fields at beginning of flowering period and of gathering seed for increase only from typical plants; this, it is claimed, has resulted in great improvement of quality and uniformity of crop.—*T. H. Kearney.*

1760. ANONYMOUS. [German rev. of: KAHN, EUGEN. Über die Bedeutung der Erbkonstitution für die Entstehung, den Aufbau und die Systematik der Erscheinungsformen des Irreseins. (On the significance of the hereditary constitution in the origin, growth and classification of the symptomatic forms of insanity.) Zeitschr. Gesamte Neurol. u. Psychiatrie 74: 69-102. 1922.] Zeitschr. Indukt. Abstamm.- u. Vererb. 29: 219-220. 1922.

1761. ÅKERMAN, Å. Untersuchungen über eine in direktem Sonnenlichte nicht lebensfähige Sippe von *Avena sativa*. [Investigation on a form of *Avena sativa* unable to live in direct sunlight.] Hereditas 3: 147-177. 1922.—In the F₂ of hybrids between Danish Novahavre (Probsteier type oats) and black oats of middle Sweden, seedlings appeared in 1920 which, though normal green at first, yellowed and died in a short time when grown in the bright light of the field. In subdued light ($\frac{1}{4}$ - $\frac{1}{2}$ sunlight) defective plants retain green color and mature seed. This form called *lutescens*, segregated in F₂ in the ratio of about 1 yellow to 70 green; parents and F₁ were all green. Analyses of F₂ and F₃ indicate 63:1 ratio, due to 3 independent homomeric (i.e., duplicate) factors, all recessive to normal green. Novahavre is assumed as unifactorial for chlorophyll and black oats of middle Sweden as bi-factorial.—*C. E. Leighty.*

1762. ALEXANDER, JEROME. The physico-chemical mechanism of mutation and evolution. Science 56: 323-326. 1922.—Solutions of salts and colloids produce remarkable "flowering plants" upon drying. "Auto-protection" due to iso-colloidism is considered. Every substance passes through a colloidal zone before reaching a visibly crystalline state. This colloidal zone interferes with normal crystallization producing feathery forms. It is more surprising that plants and animals should breed true than that they should vary since bio-colloids are so readily affected by salts, H-ion concentration, temperature, actinic and traumatic effects. Specificity of germ plasm is evidently guarded by many factors such as selective adsorption and differential diffusion. Unusual influences must nevertheless occasionally have effect but only beneficial variations survive in nature. Complications due to enzymes, hormones, etc., in higher forms are considered. Simple forms are perhaps best for experiment, but even here are complications for even filterable viruses breed true.—*P. W. Whiting.*

1763. ALVERDES, F. [German rev. of: SIEMENS, H. W. Einführung in die allgemeine Konstitutions- und Vererbungspathologie. (Introduction to the study of general constitutional and hereditary disease.) 229 p., 80 fig. Julius Springer: Berlin, 1921] Zeitschr. Indukt. Abstamm.- u. Vererb. 29: 96. 1922.

1764. BABCOCK, E. B., AND J. L. COLLINS. A case of duplicate genes in *Crepis capillaris* (L.) Wallr. Science 56: 392. 1922.—Results are reported of crossing strains which had more or less pubescence on lower surface of midrib of rosette leaves with one which lacks it. F₁ plants were pubescent and F₂ conformed to ratio, 15 pubescent: 1 non-pubescent. In another cross both 15:1 and 3:1 F₂ populations were secured.—*R. E. Clausen.*

1765. BABCOCK, E. B., AND J. L. COLLINS. Inheritance of glandular pubescence in *Crepis capillaris* (L.) Wallr. Science 56: 392. 1922.—"Bald," which lacks normal glandular pubes-

cence on involueral bracts and pedicels, has been obtained from 6 widely separated geographical locations. Bald condition in these strains was shown to be identical by crossing, and it is a simple recessive to the normal condition.—*R. E. Clausen.*

1766. BAMBER, RUTH C. (MRS. BISBEE.) **The male tortoiseshell cat.** Jour. Genetics 12:209-216. 1922.—The author discusses theories of various authors to explain the male tortoiseshell cat. Doncaster's theory that it is a freemartin with complete sex-reversal except for sterility has been tested by examination of 70 pregnant females with a total of 253 kittens. No evidence of confluence of blood vessels was found. Two of the known tortoiseshell males came from matings of tortoiseshell female by yellow male and all sibs in both cases were said to be tortoiseshell and were therefore female. Hence the freemartin theory would be discredited. The possibility is suggested that tortoiseshell male might be due to reversal of "predestined" sex by influences such as those operative in Riddle's pigeons or Goldschmidt's or Harrison's moths; unisexual broods might then be expected. One known tortoiseshell male was produced by black female crossed with yellow male. This female had previously produced only male kittens by different sires. But this mating produced, besides tortoiseshell male, 1 tortoiseshell female and 1 black of unknown sex. Dissection was made of Doncaster's sterile male tortoiseshell, which was found to be typically male. Microscopic examination of left testis showed it to be similar to right, which had been previously reported [Jour. Genetics 1915], having large amount of interstitial tissue, well-developed seminiferous tubules, but no spermatozoa. Possibility of breaking down of sex-linkage, which may also account for unexpected black females, is discussed.—*P. W. Whiting.*

1767. BATESON, W. **Evolutionary faith and modern doubts.** Nature 109:553-556. 1922.—Variations are usually distinguishable as positive or negative. Negative variations are common, positive ones are rare if they exist at all. Variations causing interspecific sterility are obviously positive ones. Until an unquestionably sterile hybrid is produced by completely fertile parents that have arisen under observation from a single source, we have no acceptable knowledge of the origin of species.—Almost all variations observed at their origin are losses of something. Very few dominant mutations have arisen in *Drosophila*, and these would not be viable in nature. Variations observed in these forms and in domesticated animals and cultivated plants have nothing to do with the origin of species. Cooperation between systematists and geneticists is needed to solve these problems of origin.—*A. Franklin Shull.*

1768. BELLING, JOHN, AND ALBERT F. BLAKESLEE. **The assortment of chromosomes in triploid *Daturas*.** Amer. Nat. 56: 339-346. 1922.—The chromosomes of diploid, triploid, and tetraploid plants of *Datura Stramonium* can be grouped into 6 size classes. Diploids show 12 sets of bivalents, and triploids 12 sets of trivalents. In triploids, the distribution of the chromosomes is at random, 2 of each set going to one pole and 1 to the other. Detached chromosomes give rise to microcytes, and non-reduction results in giant pollen grains. The functional egg-cells have 12, 13, or 14 chromosomes, the smaller numbers being most frequent. In triploid progeny, the inheritance of 2 pairs of genes is trisomic. Plants with 1 extra chromosome show 11 bivalents and 1 trivalent, and plants with 2 extra chromosomes show 10 bivalents and 2 trivalents.—*M. E. Farnham.*

1769. BLAKESLEE, A. F., JOHN BELLING, AND J. ARTHUR HARRIS. **The probability established by a culture of given size that a mating is capable of producing only dominant individuals.** Amer. Nat. 56: 458-461. 1922.—Tables are given for providing a statistical criterion for the distinction between matings capable of producing only dominant individuals, and those which should give 1:1, 2:1, 3:1, 5:1, 8:1, 11:1, and 35:1 ratios of dominant to recessives. The need of such tables is discussed, and the theory upon which they are based is explained.—*M. E. Farnham.*

1770. BLAKESLEE, A. F., JOHN BELLING, M. E. FARNHAM, AND A. DOROTHY BERGNER. **A haploid mutant in the jimson weed, *Datura Stramonium*.** Science 55: 646-647. 1922.—Two

haploid (1n) *Datura* plants were secured in an attempt to induce chromosomal irregularities by exposure to low temperatures. Root cells showed 12 chromosomes, the normal (diploid) number being 24. The late prophase and metaphase of the 1st division of pollen-mother cells show 12 unpaired chromosomes only, which undergo a "reduction" into 3 plus 9, 4 plus 8, etc. These reduced groups divide in the 2nd division to form 4 cells, but young pollen grains with less than 12 chromosomes apparently all abort. Non-reduction takes place in some cells, resulting in 2 giant cells from each pollen-mother cell, and apparently forming surviving pollen grains equal in size to those from diploid plants. The haploid *Datura* is a new type among flowering plants since it is a sporophyte with the somatic chromosome number characteristic of the gametophyte, and since the chromosomes undergo a process of reduction without synap-
totic mates.—J. Lincoln Cartledge.

1771. CASTLE, W. E. **The Y-chromosome type of sex-linked inheritance in man.** *Science* 55: 703-704. 1922.—The condition in man called webbed toes is found only in males, and was reported to be transmitted from father to son, through 4 generations, independently of the female line of descent. It therefore has the distribution in heredity of the Y-chromosome. This type of hereditary transmission of characters has been observed also in 2 species of fish.—H. W. Feldman.

1772. CHEVALIER, AUGUSTE. **L'origine du maïs d'après G. N. Collins.** [Rev. of: COLLINS G. N. **Origin of maize.** *Amer. Anthropol.* 23: 503-506. 1921.] *Rev. Bot. Appl.* 2: 652-658. 1922.

1773. CHURCHILL, E. P., JR. **The effects of so-called conjugation in shelled Rhizopods.** *Amer. Nat.* 56: 466-470. 1922.—Individuals of *Diffugia corona* often pair off and attach themselves by their oral surfaces, suggesting a true conjugation. This attachment can often be brought about by subjecting 2 animals to distilled water for a few hours. In studying the effect of this process on inheritance, the author isolated, in each case, 2 specimens differing markedly in spine number or shell size. Each individual was allowed to divide and the daughter animals occupying the original shells were induced to undergo attachment by treatment with distilled water, which the other daughter animals were allowed to start asexual lines. In this way 2 lines were obtained from each of the original animals, 1 which had undergone apparent conjugation and 1 which had reproduced asexually. A comparison of these lines indicates that the progeny from one "exconjugant" was not influenced by the genetical constitution of the other "conjugant" or that there was no intermingling of hereditary characters. This in turn indicates that the process of attachment observed in *Diffugia* and other shelled rhizopods is not a true conjugation and that there is no interchange of nuclear material. At the present time the author has not been able to make a cytological study of the behavior of the nuclei during the process of attachment.—W. H. Taliaferro.

1774. CLAUSEN, R. E., AND J. L. COLLINS. **The inheritance of ski wings in *Drosophila melanogaster*.** *Genetics* 7: 385-426. 1922.—Ski wings, discovered by Clausen and Collins, was found by them to differ from wild-type in 2 previously unknown loci lying in the 2nd and 3rd chromosomes respectively. For the mutant genes to produce a visible variation in the wing those of both the 2nd and 3rd chromosomes must be present together,—the former Si_{II} either heterozygously or homozygously (being dominant), and the latter, si_{III} , homozygously (being recessive). Homozygous Si_{II} is not lethal, and tends to be more extreme than heterozygous. On account of these conditions, various unusual genetic ratios of ski to non-ski flies were obtained in crosses, but the genetic composition of flies with respect to ski genes can always be controlled, even where effects of the latter are invisible, by utilizing their linkage relations with other ("identifying") genes. Such methods were used by the authors in making up stocks for back-crosses to determine the exact loci of Si_{II} and si_{III} . For both determinations 3-point back-crosses were made, all 4 possible "complementary" arrangements of the 3 heterozygous pairs of genes being tested in order to reduce the error due to differential viability. Si_{II} was found to be at 30.8 (on basis of 1290 crossovers from star and 660 from

black among 4,845 flies) and si_{III} at 43.4 (740 crossovers from *dichaete* and 1605 from *spineless* among 15,621). Coincidence in former experiment was 43.8 per cent; in latter, 131.5 per cent in spite of the small distances involved. Viability of *ski* was about 90 per cent of non-*ski* in good cultures, lower in poor cultures; *ski* also tends to hatch later than normal. Under good conditions it is valuable for genetic work. In the theoretical discussion the authors point out reasons why the mutations of *Drosophila* cannot be explained away as recombinations.—H. J. Muller.

1775. COHEN, STUART, C. P. *Iets over selektie-pluk proeven*. [Notes on selection-pluck experiments.] *De Thee* 1: 101-106. 1920.—Eleven hundred plants have been included in an individual-yield study in a search for desirable parent plants. Extreme variability in yield was found, due partly to age differences. This variability was considerably reduced by separating the trees examined into 10 crown classes. Even within the same crown class there is much difference between different trees, and the differences are not entirely constant, a tree giving a good yield at one picking perhaps yielding poorly at a subsequent picking. This last fact may permit of analysis. For example, a low temporary yield for a plant may be correlated with a *Helopeltis* attack, indicating its susceptibility to the insect.—Carl Hartley.

1776. COHEN, STUART, C. P. *Produktievermeerdering door selektie*. [Yield increase by selection.] *De Thee* 1: 68-71. 1920.—The author recommends preliminary selection of individual tea plants by 3 criteria: weight per tip, length of time elapsing before the shoot is ready for the next picking, and the number of side shoots arising from the cut ends. This has the advantage over selection based on determination of individual yields in that it requires less labor and permits the discovery of plants which are especially high in one or another of the above 3 characters and therefore valuable for crossing purposes. Weakness in one of the other characters might, however, keep the yield down and prevent detection by the total-yield method.—Carl Hartley.

1777. COOK, O. F. *One-variety cotton communities*. U. S. Dept. Agric. Bull. 1111. 50 p. 1922.—The author discusses importance of pure seed in cotton production, disadvantages of growing several varieties in the same community and difficulties under prevailing system of obtaining commercial quantities of pure planting seed of superior varieties, and of initiating production of such varieties. Present multiplicity of varieties or varietal names is shown to be an unfavorable factor in cotton production. Solution of the problem is believed to lie in organizing communities to grow only 1 variety. The advantages of such organization in facilitating field classing and orderly marketing of product and proper agricultural diversification are pointed out. Descriptions are given of communities already organized on 1 variety basis for the production of Pima, Meade, Durango, Acala, and Lone Star cottons.—T. H. Kearney.

1778. COURRIER, R. *Sur l'indépendance de la glande séminale et des caractères sexuels secondaires chez les poissons. Etude expérimentale*. [Independence of the seminal gland and secondary sex-characters in fishes. Experimental studies.] *Compt. Rend. Acad. Sci. Paris* 174: 70-72. 1922.—In *Gasterosteus aculeatus*, the male at breeding season possesses 2 secondary sex-characters: (1) rose-colored pigmentation of belly, and (2) a musky secretion of the renal cells. Testes of males caught in winter and kept at elevated temperatures develop exactly as those of males caught in summer, the breeding season. This induced development of testis is not accompanied by development of secondary sex-characters. Particularly is this true of the secretion of the renal cells, although the animal is kept at the same conditions of temperature and nutrition as in summer. A faint coloration of the males under the experimental conditions occasionally appears. The author concludes that the 2 secondary sex-characters of stickleback react differentially to the sexual hormone of the interstitial cells; there appears to be a quantitative difference. The amount of hormone required to influence the chromatophores is less than the amount necessary to cause the characteristic reaction of the nephrocytes.—S. W. Geiser.

1779. DUNN, L. C. A gene for the extension of black pigment in domestic fowls. Amer. Nat. 56: 464-466. 1922.—Black fowls differ by 1 dominant autosomal gene from Columbian and buff varieties in which black pigment is restricted to hackle, flight, and tail feathers. Black is incompletely epistatic over silver; black fowls therefore contain buff, the recessive allelomorph of this sex-linked gene. Evidence is derived from reciprocal crosses between Black Orpington and Columbian pattern (Light Brahma) fowls, and from backcrosses of F_1 with non-black individuals.—H. W. Feldman.

1780. DUNN, L. C. Inheritance of plumage color in crosses of buff and Columbian fowls. Amer. Nat. 56: 242-255. 1922.—The results of crossing Buff (Orpington and Ply mouth Rock) and Columbian (Light Brahma) varieties of fowls are reported. The 2 varieties were found to differ (1) in a dominant sex-linked gene (*S*, silver) which inhibits development of buff in the plumage of Columbian varieties; (2) by multiple genes governing the degree to which black is produced in hackle, wing, and tail feathers. It is suggested that Columbian and Buff varieties originally diverged through the occurrence of a gene mutation affecting the inhibition of buff, and through the subsequent accumulation by selection of factors for much black pigment in wing, tail, and hackle feathers of Columbian varieties; and by a reverse selection in Buff varieties.—L. C. Dunn

1781. DÜRKEN, BERNHARD. Versuche über die Erbllichkeit des infarbigem Lichte erworbenen Farbenkleides der Puppen von *Pieris brassicae*. [Studies on the inheritance of the coloration induced in the pupae of *Pieris brassicae* by colored light.] Nachrichten K. Ges. Wiss. Göttingen 1919: 428-434. 1919.—Of chrysalids from larvae of *P. brassicae* raised and allowed to pupate in orange light 77.8 per cent were green, 22.2 per cent being white and black. Only 7 per cent of those in control cultures raised in normal non-colored environment were green, 93 per cent being white and black. Orange light prevents the development of black and white pigments and allows the green blood and tissues to shine through the integument.—When merely the pupa during the process of pupation was exposed to orange light, 62.8 per cent of green pupae were obtained. Butterflies from these green pupae produced 98.2 per cent of green pupae when the larvae pupated in orange light, and 45.9 per cent green pupae when the larvae pupated in diffuse white light with gray background.—Pupal color depends in large measure upon that of the parents. Particularly, the green condition acquired by exposing the pupa to orange light was transmitted to unexposed progeny. Moreover, if the application of orange light is repeated by exposing the offspring, the effect is cumulative. Practically all the offspring of the next generation assume the acquired condition. Since the pupa at the time of the application of orange light is not yet sexually mature, the germ cells probably do not react immediately to orange light but acquire later the condition previously produced by the modifying agent in the medium that surrounds them.—Tentative conclusion: Pupation in orange light causes a specific chemical condition of the body saps. The germ cells acquire this condition. The transmission of this acquired character is not by the modification of special nuclear vehicles of heredity but by a change in the chemical plasmatic constitution of the gametes. The inheritance is not karyogenetic but plasmogenetic.—John H. Gerould.

1782. ENGLEADOW, F. L., AND J. P. SHELTON. An investigation upon certain metrical attributes of wheat plants. Jour. Agric. Sci. 12: 197-205. 1922.—One-year's results (1920) with pure lines of Polish and Kubanka wheats are reported from an investigation with the primary object of determining whether the ratio of length of glume to length of rachis would provide a "compensated" observation as a means of removing the masking effects of fluctuation due to unattainable uniform conditions of growth. A high correlation of glume-length and rachis-length was found in both wheats but the ratio of these quantities had as great a coefficient of variation as the absolute glume-length, and, therefore, the ratio possesses no special value in investigation. Correlations of about +.5 were found among the tillers of any 1 plant for glume-length and rachis-length. With similar metrical observations it is concluded that observations should be confined to the main stalk of every plant and that it is desirable to limit the experimental population to plants with the same number of tillers. Weight c:

mother seed was not correlated with degree of growth of plant as judged by lengths of glume and rachis.—*R. D. Lewis.*

1783. EYSTER, WILLIAM H. Scarred endosperm and size inheritance in kernels of maize. Missouri Agric. Exp. Sta. Res. Bull. 52. 10 p., 2 pl. 1922.—The character "scarred endosperm" (Se^{sc}) appears as an irregular crater-like cavity in the endosperm on the abgerminal side near the crown of the kernel. The collapse of the pericarp over the cavity usually causes the appearance of "rough" indentation. Scarred kernels are smaller than normal kernels of the same ear, particularly in thickness, and are lighter in weight.—Scarred is inherited as a simple Mendelian recessive. The author points out that this, like various other characters in maize and other plants, is a quantitative character determined by a single factor difference.—*L. J. Stadler.*

1784. FABRICIUS, L. [Rev. of: (1) FRUWIRTH, C., UND TH. RÖMER. Einführung in die landwirtschaftliche Pflanzenzüchtung. (Introduction to agricultural plant breeding.) 150 p., 27 fig. Berlin, 1921. (2) BAUR, ERWIN. Die wissenschaftlichen Grundlagen der Pflanzenzüchtung. (Scientific basis of plant breeding.) 115 p., 11 fig. Berlin, 1921 (see Bot. Absts. 12, Entry 1034).] Forstwiss. Centralbl. 44: 119-121. 1922.—These books are brief and written in simple comprehensible language. The 1st emphasizes the practice, the 2nd the theory of plant breeding. They devote practically no space to breeding of forest tree species, for the good reason that foresters have done nothing beyond a little work on selection of seeds for planting. The difficulty of the longer generations in trees is pointed out. [See also Bot. Absts. 12, Entry 1831].—*W. N. Sparhawk.*

1785. FEDERLEY, HARRY. Ueber einen Fall von Criss-cross-Vererbung bei einer Artkreuzung. [A case of criss-cross inheritance in a species cross.] Hereditas 3: 125-146. 1922.—The dark, blue-black pigmentation and coarsely mottled pattern of the caterpillar of *Pygaera anachoreta* are dominant to the lighter color and finely mottled pattern of *P. curtula*. Save in a few details the 2 patterns are inherited as sex-linked units. F_1 caterpillars from *P. curtula* ♀ × *P. anachoreta* ♂ are alike in both sexes and resemble *P. anachoreta*, but F_1 from the reciprocal cross, *P. anachoreta* ♀ × *P. curtula* ♂ shows criss-cross inheritance. All the ♂♂ are dark and coarsely mottled like the mother; all the ♀♀ are light and finely mottled like the father. The F_1 species-hybrid ♀ is apparently sterile and matures so much later than the ♂ (the following season) that it has been impossible to obtain the F_2 , but *P. anachoreta* ♀ × the (*anachoreta*-like) F_1 ♂ has given numerous cultures and individuals of both sexes, all *anachoreta*-like save in minor details. *P. curtula* ♀ × the F_1 (*anachoreta*-like) ♂ has produced a few (*anachoreta*-like) ♂♂ only.—The chromosomes of the F_1 hybrid ♂ in gametogenesis do not conjugate, but divide equationally in maturation, each spermatozoon receiving a complete set of chromosomes of each species. Heterochromosomes are not distinguishable in either *P. anachoreta* (with its 30 chromosomes) nor in *P. curtula* (with 29), but assuming that $XX = ♂$, $XY = ♀$, and that the coloration of the 2 species, *a* and *e*, is borne by Xa and Xc , respectively, then the F_1 hybrid from *P. anachoreta* ♀ × *P. curtula* ♂, back-crossed with the ♀ of either species (XaY or XcY) would give only *P. anachoreta*, for the progeny receive in each case from the hybrid ♂ both Xa and Xc . Thus ♂♂ from each back-cross are "triploid and presumably contain also three X-chromosomes." "The females are also triploid, but these contain the allosomes XXY ." Intersexual individuals, poorly developed as a rule, are found among them. The Y-chromosome contains "factors which influence the differentiation of sex and develop specific female characteristics in spite of the presence of the two X-chromosomes which ought to ♂-mark the individuals." The sex-linked pigmentation factors, however, are not carried by the Y.—An anomalous *anachoreta*-like ♀ larva was found in a large brood from *P. anachoreta* ♀ × *P. curtula* ♂. Appearing simultaneously with the males it was mated with a brother, but no eggs developed. This individual is believed to have "arisen through non-disjunction in an egg of the heterogametic mother," ($XaXcY$). "It must have received the Y-chromosome from the mother; its development into a female would otherwise have been impossible. The Xa chromosome must also have been obtained

from the *anach.* mother; the *anach.* resemblance would not otherwise have been obtained."—*John H. Gerould.*

1786. GANTE, TH. Über eine Besonderheit der Begrannung bei Fatuoid-Heterozygoten. [On a peculiarity of bearding on fatua-like heterozygotes.] *Hereditas* 2: 410–415. 1922.—Nilsson-Ehle previously described a homozygous fatuoid mutation which differs from *Avena sativa* in that all flowering glumes are awned, rachis and kernel base are pubescent, and a basal ring is present. He found another mutation, a heterozygous fatuoid mutant, which segregates out in 1:2:1 ratio. This heterozygote is stronger awned than the normal, the awn is more bent, the base of lower kernel and rachis are more pubescent, and it has no basal ring. The author found that these heterozygotes have either all glumes awned or, where there are 3, the 2 lower ones. He states that this 2-awnedness does not depend on bud mutation, that no intermediate forms appear, and that it relates more to the modification of a varietal characteristic.—*L. J. Henning.*

1787. GOLDSCHMIDT, R., UND E. FISCHER. *Argynnis paphia-valesina*, ein Fall geschlechtskontrollierter Vererbung bei Schmetterlingen. [*Argynnis paphia-valesina*, a case of sex-controlled heredity in Lepidoptera.] *Genetica* 4: 247–278. 1922.—A "melanic" female variety, *valesina*, of the silver spot, *A. paphia*, occurs with the typical yellowish-brown female over the greater part of the palaearctic realm. The former alone occurs in the mountains of North China. Eastward, the proportion of dark females to brown diminishes. *Valesina* is rarely found with the type female in the low plains of Central Europe, and is not represented in North Africa, nor in Japan.—Fischer bred at Zürich (1915–1919) 4 lines of stock from a single Königsberg *valesina* ♀, the hibernating caterpillars of which matured in 1915 as 94 ♂♂, 35 ♀♀ *paphia*, 25 ♀♀ *valesina*. Methods are given for management of egg-laying (in large glass cylinders lined with netting) care of young caterpillars during their long fast and hibernation (from July, or August, to April), their feeding on leaves of the violet, and for the pairing of the butterflies.—Goldschmidt explains var. *valesina* as due to a single dominant non-sex-linked factor, *V*, the ♀ *Valesina* being *VV* or *Vv*, the ♀ *paphia* always *VV*. The ♂ is uniformly *paphia*-like, but may carry latent the *valesina* factor, being *VV*, *Vv* or *vv*. In regions in which *valesina* does not occur, the male is *vv*.—Nine combinations of the 3 genotypes of the male with the 3 of the female are possible. Six of them were represented in Fisher's cultures:

1. Male *vv* × female *vv* → 16 families, females all *paphia* (except 1 waif).
2. Male *Vv* × female *vv* → 5 families, females 104 *vv* + 68 *Vv*.
3. Male *VV* × female *vv* → 3 families, females 168 *Vv* (+ 1 stray *vv*).
4. Male *vv* × female *Vv* → 11 families, females 357 *vv* + 353 *Vv*.
5. Male *Vv* × female *Vv* → 13 families, females 143 *vv* + 367 (*Vv* + *VV*).
6. Male *VV* × female *Vv* → 1 family, females 21 (*Vv* + *VV*) all *valesina*.

Thus in only 1 case has a *valesina* ♀ produced only *valesina* offspring, and homozygous *VV* females do not appear as the mothers of broods. Is the *VV* combination lethal? 2.57: 1 is the ratio derived from the *Vv* × *Vv* mating, indicating a shortage of *VV* ♀♀. Two of the largest families contain, respectively, 60 *Vv* + 30 *vv* and 61 *Vv* + 27 *vv* females, instead of 3 *valesina*: 1 *paphia*. *VV* females can be demonstrated as mothers in 2 mixed broods, assuming that the (wild) fathers must have been *vv*. Hence it is impossible that *VV* is lethal, even in the female, but a numerical summary shows that in this sex it is "semilethal," or relatively susceptible, and that the ♀ *Vv* is not quite so viable as the ♀ *vv*.—The peculiarity of sex-controlled heredity is that ordinary Mendelian segregation of one or more factors is phenotypically visible only in 1 sex. The explanation of this phenomenon must be physiological. It may be assumed either (1) that, in view of sex differences known to occur in the blood of Lepidoptera, the chemical constituents necessary for the realization of certain genes may be lacking in the male, through the genes are present, or (2) at the moment in the development of wing pigment when a sex-controlled factor is about to play its part, differentiation in the male has already reached a point at which no further change is possible, whereas differentiation in the female is not yet so far advanced and the organism therefore is susceptible to the action of the genetic factor. The latter explanation is regarded as the more satisfactory.—*John H. Gerould.*

1788. GOODSPEED, THOMAS HARPER, AND ROY ELWOOD CLAUSEN. Interspecific hybridization in Nicotianas. I. On the results of backcrossing the F_1 *sylvestris*-*Tabacum* hybrids to *sylvestris*. Univ. California Publ. Bot. 11: 1-30. 1922.—The authors summarize their "results" as follows: (1) Three *sylvestris* derivative lines, originating from backcrosses of F_1 *sylvestris*-*purpurea* hybrids to *sylvestris*, have been studied and shown to become identical with normal *sylvestris*. (2) One *sylvestris* derivative line from the *sylvestris*-*macrophylla* series has also been demonstrated to be identical with normal *sylvestris*. (3) A cross of a *sylvestris* derivative from the *sylvestris*-*purpurea* series with *purpurea* resulted in a dimorphic F_1 , which may be interpreted as evidence of the existence of a section of *Tabacum* elements in the *sylvestris* derivative. Since the *sylvestris* derivative was heterozygous for this section of *Tabacum* elements, this provides presumptive evidence of eventual purification of *sylvestris* derivatives by a process of zygotic elimination.—W. A. Setchell.

1789. GUTHRIE, F. B. William J. Farrer, and the results of his work. Dept. Agric. New South Wales Sci. Bull. 22. 26 p., 1 fig. 1922.—A biographical sketch is given of W. J. Farrer and a summary of his work. This pioneer wheat breeder graduated from Cambridge as senior wrangler in the mathematical tripos. He was strikingly successful in the production of wheat varieties combining the 3 characters high milling quality, resistance to stem rust, and drought resistance. Among the most important Farrer wheats produced have been Bobs, Federation, Comeback, Cedar, and Florence. Farrer's ideas in genetics are set forth and a Farrer bibliography is appended.—L. R. Waldron.

1790. GUYÉNOT, E., et K. PONSE. L'organe de Bidder et les caractères sexuels secondaires du crapaud (*Bufo vulgaris* Laur.). [The organ of Bidder and the secondary sexual characters of the toad (*Bufo vulgaris*).] Compt. Rend. Soc. Biol. 86: 751-752. 1922.—Harms had indicated that the secondary sex characters, such as sexual attraction, clasping reflex, etc., are dependent on the organ of Bidder. This statement is contradicted experimentally by removing the organ of Bidder from 10 toads and noting no diminution of secondary sex characters in these toads the following year. Another group of 26 had the testes removed and they showed none of the secondary sex characters. A 3rd group had the organ of Bidder and the testes extirpated and these toads showed complete absence of the secondary sex characters the following summer. The authors conclude that the secondary sex characters are dependent on the testes and not on the organ of Bidder. Also, the organ of Bidder is a rudimentary organ, as observed by them in the precocious development of a young male toad.—Oscar W. Richards.

1791. GUYER, M. F. Studies on cytolsins. III. Experiments with spermatotoxins. Jour. Exp. Zool. 35: 207-223. 1 fig. 1922.—Fowls subjected to repeated injections of rabbit-sperm produce a spermatotoxic serum which is very toxic to rabbit spermatozoa *in vitro*, and variably toxic to rabbit spermatozoa *in vivo*. Complete sterility and degeneration of the spermatic tubules may be the result in extreme cases of this toxic action. In less extreme cases inactivation of many spermatozoa, or reduction of their number, or complete absence of them from the semen is frequently the result of such injections into the blood stream. These spermatotoxins produced in the fowl are equally toxic *in vitro* for the spermatozoa of rabbits and guinea-pigs. The rabbit is able to produce spermatotoxins against its own spermatozoa. Thus, males frequently injected intravenously with suspensions of their own spermatozoa showed weakened sperm-cells. The author holds that "since an animal can thus on occasion build antibodies against its own tissues when these have become misplaced or altered, and since antibodies can directly or indirectly affect the germ cells, it is reasonable to suppose that such influences may be the source of certain germinal variations."—S. W. Gieser.

1792. HAECKER, VALENTIN. Einfach-Mendelnde Merkmale. [Simple Mendelian characters.] Genetica 4: 195-234. 1922.—This is a discussion of the nature of simple Mendelian characters in terms of their developmental characteristics and of related problems of theoretical genetics. The 1st part deals with the difference between racial and specific characters

and presents arguments for the necessity of attacking the problem both from the angle of genetic behavior and phenogenesis. Phenogenesis aims to bridge the gap between characters of an individual and its germinal elements. Its method is to trace back on ontogenetic processes to the point at which divergence occurs and to determine whether differences rest on simple or complex causation.—Simple Mendelian characters exhibit simple causation and autonomous development, but irregularity in inheritance is associated with complex causation and correlative associations in development. The author states that simple Mendelian characters exhibit a series of peculiarities; particularly, high degree of ubiquity (parallel occurrence in taxonomically related forms), simple causation and autonomous development, and also a certain degree of irreversibility as shown by the occurrence of reverse mutations. He states that simple Mendelian characters in the widest sense correspond with racial characters; he argues that the higher the degree of ubiquity of a character, the simpler causation and greater autonomy it will exhibit in development. From these considerations he argues for the superficiality of simple Mendelian characters, and cites numerous examples in support of his theses.—The 2nd part of the paper is concerned with a discussion of difficulties inherent in present conceptions of the mechanism of heredity and with possible means of effecting an improvement in these conceptions. In general he commends attempts to appeal to cytology for an elucidation of genetic behavior, but holds that present mechanistic conceptions must eventually make way for physiological ones. He describes various features of the chromosome hypothesis, particularly linkage relations and crossing-over. Cytological difficulties in accepting Morgan's scheme are considered at length; other theories of linkage and crossing-over are also discussed. He holds that any attempt to develop relations of pure and impure segregation, linkage and recombination of linked factors to cytological results must satisfy these conditions: (1) the cytological processes must ultimately be expressed in physiological terms; (2) the pluripotency of the germplasm must be considered, the phenotypes corresponding to different potencies representing the simple Mendelian mutants; and (3) the occurrence of intracellular alterations of genes, whereby one member of a pair of genes may be altered prior to segregation (leading to imperfect segregation), must be recognized. The author argues that when 2 races differing in characters of simple causation are crossed the 2 germplasms are identical save in the particular factors separating the races and therefore produce no enzymes which alter the genes, consequently perfect segregation follows; but when parental forms differ in characters of complex causation alteration activities may occur followed by imperfect segregation or complicated hereditary phenomena. When one parent contains 2 linked mutant genes, he argues that recombination may be an evidence of alteration in genes, due to the greater complexity of such conditions, whereby one member of a pair is converted into the other in a definite frequency. Finally he points out that phenogenetic investigations indicate that all transition stages occur between simple Mendelian characters and those which exhibit irregular inheritance, and that since the underlying mechanism of heredity must be the same for all characters, a further search may disclose a more general principle, of which the present hypotheses are merely special cases.—*R. E. Clausen.*

1793. HALDANE, J. B. S. Sex ratio and unisexual sterility in hybrid animals. *Jour. Genetics* 12: 101-109. 1922.—“When in the F_1 offspring of two different animal races one sex is absent, rare or sterile, that sex is the heterozygous sex.” This rule is found to apply to practically all of the cases (44 references) so far observed.—*E. C. MacDowell.*

1794. HARRINGTON, J. B. The mode of inheritance of certain characters in wheat. *Sci. Agric. [Canada]* 2: 319-324. 1922.—Working with 6 well known Canadian wheats, the segregation for seed color occurred in both 3:1 and 15:1 ratios, red being dominant to white. The variety Kitchener has 2 factors for seed color, but Hard Red Calcutta and Red Bobs have 1 or 2 in different selected lines. Several factors appear to govern seed texture, the distribution in F_2 approximating the extreme range of the parent varieties. Two factors appear to be concerned in the production of fully awned spikes. Factors present in varieties studied are designated as follows: Hard Red Calcutta, *BBTT* (fully bearded); Taylor's Wonder, *BBtt* or *bbTT* (tip-awned); and White Bobs, *bbtt* (bald). These parental combinations reappeared

in the F_2 of a cross between the first and last varieties named together with several heterozygous forms intermediate between the parent sorts. $BBTl$ and $BbTT$ gave long tip-awns; $Bbtt$ and $bbTl$, short tip-awns; and $BbTl$, fairly short. Chaff color segregated for dark red: light red: white in 1:2:1 ratio.—*C. E. Leighty*.

1795. HARRIS, J. ARTHUR, and H. D. GOODALE. The correction between the egg production of the various periods of the year in the Rhode Island Red breed of domestic fowl. *Genetics* 7: 446-465. 7 fig. 1922.—Annual egg records of 1,658 birds made during their 1st laying year of 365 days were studied. These records were all secured from the flock at the Massachusetts Agricultural Experiment Station during 1912-1919. Calculated correlation coefficients between the production of individual months and annual records indicate that the number of eggs laid by these hens during January, December, and September bear the closest relationship to annual production. The above correlations for the Rhode Island Red breed differ from the Storrs White Leghorns, where the highest correlation was found during July, August, and September. The months of January and September, respectively, show the 2 highest correlation coefficients to the production of the other 11 months of the year. The highest positive correlation between annual egg production and the deviation of monthly records from their probable value existed for December and a negative coefficient exists for March, April, May, June, and July. Correlation determinations between the production of individual months enabled the authors to apply 2 laws previously found applicable to the White Leghorn breed. "First, the correlation between the egg production of the individual months tends to become smaller as the months considered are more widely separated in time. Second, there is a more intimate correlation between the egg production of the autumn and winter months at the beginning and end of the contest year than between the egg production of these months and the productions of the spring and summer months."—*F. A. Hays*.

1796. HARRIS, J. ARTHUR, and ALBERT GOVAERTS. Note on assortative mating in man with respect to head size and head form. *Amer. Nat.* 54: 381-383. 1922.—Because of Pearson's suggestion that correlations indicating assortative mating may be due to the fact that husbands and wives are in general drawn from the same local races, and further, because of the importance attached by anthropologists to cephalic index as a character differentiating the races of Europe, the authors thought it desirable to obtain some measure of the correlation between husband and wife with respect to cephalic index. They used as material 319 Dutch families, finding the correlation between cephalic index of husband and wife within this racial group insignificant. The correlation between length of head of husband and wife is also insignificant, while the breadths may perhaps be significantly correlated.—*Sylvia L. Parker*.

1797. HAWKES, ONERA A. MERRITT. Studies in inheritance in the hybrid *Philosamia* (*Attacus*) *ricini* (Boisd.) ♂ × *Philosamia* *cynthia* (Drury) ♀. *Jour. Genetics* 12: 111-135. 1922.—Part II. Pupal characteristics. Cocoon color of *P. ricini* is pure white; of *P. cynthia*, red brown. In F_1 between the 2 species there were only intermediates. In succeeding generations there was no complete segregation, and the effects of moisture complicated the case. Part III. Imaginal characteristics. (1) Inheritance of color. *P. cynthia* and *P. ricini* differ strikingly in the color of the middle portion of the wings due (a) to arrangement of scales, and (b) to pigmentation of the scales. In F_1 the Vandyke brown of *P. ricini* is apparently dominant to the mottled yellow of *P. cynthia*, but microscopical examination shows the dominance to be incomplete due to the presence of a few colored scales of *P. cynthia*. In F_2 there was segregation of color into 4 groups, *DK* (dark, *ricini*-like), *DKK* (very dark, a new character), *LI* (light, *cynthia*-like), and *LII* (a new pale type). *LII* bred true for 3 generations, *DKK* for 2. No sex linkage, nor correlation between scale colors and the colors of the larva, was observed. (2) Inheritance of scale shape. Scales studied were taken from a limited area just beyond the outer angle of the lunule on the anterior right wing. Matings were made at random for 5 inbred generations. The *cynthia* characteristics (wide, several long prongs) showed the greater amount of influence in F_1 . F_2 showed greater variation but no segregation into original types. Two new forms appeared in the F_2 , (a) rapidly converging sides and (b)

barrel-shape. F_4 included 3 families with considerable homogeneity. The remaining families were similar to those in earlier generations. In F_4 some individuals have characteristic scales. The recessive, narrow, 2-5 pronged ricinian scale breeds true. In F_6 a new type of scale, barrel-shaped, is "apparently stable for one generation." It is concluded that shape of scales must be due to a number of independent factors for (a) length, (b) number of prongs, (c) relative length of prong, (d) parallel or converging sides. (3) Inheritance of size. As a criterion of size the distance from base of wing to middle of the eye spot was taken, which in *P. ricini* was 49 mm. and in *P. cynthia* 59 mm. F_1 individuals had approximately the size of *P. ricini*. In the 5 succeeding generations the sexual size difference of *P. cynthia* was lost. Hybridization apparently caused a break-up of the sex complex of *P. cynthia*. No complete segregation occurred. Inbreeding was detrimental to size only to a very small extent; fertility was not impaired. (4) Sex ratio. F_1 showed an excess of females (63 ♀♀, 46 ♂♂), but all succeeding generations an excess of males. (5) Inheritance of white hairs on the abdomen of *P. ricini* vs. brown with tufts of white in *P. cynthia*. No regularity of inheritance was noticed. Every variation between *P. ricini* and *P. cynthia* was produced, but the extremes were rare.—Lloyd C. Fogg.

1798. HILSON, G. R. Uniformity of length of cotton hairs. Agric. Jour. India 16: 564-566. 1921.—Methods are discussed for rapid determination of length of fiber in cotton breeding. Close correspondence is found between results obtained by measurement of numerous individual fibers and by Balls' "maximum combed length" method.—T. H. Kearney.

1799. HORLACHER, L. J., and E. S. GOOD. Breeding experiments with Kentucky mountain ewes. Kentucky Agric. Exp. Sta. Bull. 243. 137-199, 69 fig. 1922.—An account is given of 6 years' breeding work in an attempt to improve the characteristic of the progeny and eventually build up the flock by the use of pure bred rams. The progeny of mountain ewes with Hampshire, Cheviot, Southdown, Rambouillet, and mountain rams were compared and some of these hybrids were again crossed with either a ram of the same breed or of another breed. The per cent of twin lambs produced by the above named rams respectively was 71.8, 63.9, 44.1, 37.5, and 31.5. The Rambouillet was the most satisfactory ram used for improving the mountain ewes. The grade Hampshire lambs gained more rapidly but lacked quality. The Southdown grades possessed quality but gained slowly and the ewes were too small. The Cheviot grades grew more rapidly than Southdown grades and had finer quality than Hampshire and Rambouillet grades. Use of pure bred rams increased the weight of the fleece from 5 pounds to 5.74-7.52 pounds.—W. D. Valleau.

1800. JONES, SARAH V. H. Studies on inheritance in pigeons. IV. Checks and bars and other modifications of black. Genetics 7: 466-507. 13 fig. 1922.—The "bluing" series in pigeon color is described in 6 types according to the amount of blue color in the plumages. These are classified as epistatic in hereditary behavior in the same order. The types are named (1) full black, (2) black blue-tail, (3) medium check, (4) sooty blue, (5) blue black-barred, (6) blue barless. Factor *S* effects a uniform distribution of pigment in the barbules of black feathers while *s* indicates the clumped condition in blue feathers. Black thus differs from barred in a single factor shown by breeding tests. Breeding tests between 5 pairs of heterozygous blacks gave 25 blacks and 8 checks, a typical monohybrid ratio. Eleven matings between individuals heterozygous for check gave 59 checks to 18 barred, indicating a 3 to 1 ratio. A factor *C* is postulated which is not linked to *S* but can act only in the presence of *s* to produce the checked patterns. A factor *T* hypostatic to *S* accounts for class 2, black blue-tail birds. Factor *S_o* accounts for sooty. Barless is known only to be recessive to barred *B_a*. These factors are not of a multiple allelomorphic series.—F. A. Hays.

1801. KEARNEY, THOMAS H. The uniformity of Pima cotton. U. S. Dept. Agric. Circ. 247. 6 p. 1922.—Evidence that cotton varieties do not "run out" if protected from cross-pollination and mixture of seed is afforded by the history of Pima variety of American Egyptian cotton. A method is described of maintaining a supply of good planting seed of this variety

and evidence given from roguing statistics and from results of specially planned experiments that purity of this variety has been preserved during 7 years of commercial production in Arizona.—*T. H. Kearney*.

1802. KOEHLER, OTTO. *Neuere Arbeiten über hennenfiedrige Hahne*. [New studies on hen-feathered cocks.] *Zeitschr. Indukt. Abstamm.- u. Vererb.* 29: 73-82. 1922.—This is a German review of several recent papers on hen-feathering.—*O. E. White*.

1803. KOEHLER, OTTO. [German rev. of: GEROULD, JOHN H. *Blue-green caterpillars: The origin and ecology of a mutation in hemolymph color in Colias (Eurymus) philodice*. *Jour. Exp. Zool.* 34: 385-412. 1 pl. 1921 (see *Bot. Absts.* 11, Entry 1348).] *Zeitschr. Indukt. Abstamm.- u. Vererb.* 29: 141-143. 1922.

1804. KUTTNER, O. [German rev. of: BANTA, ARTHUR M. *Selection in Cladocera on the basis of a physiological character*. *Carnegie Inst. Washington Publ.* 305. 170 p. 1921.] *Zeitschr. Indukt. Abstamm.- u. Vererb.* 29: 141. 1922.

1805. LANCEFIELD, D. E. *Linkage relations of the sex-linked characters in Drosophila obscura*. *Genetics* 7: 335-384. 1922.—*D. obscura* is slightly larger and of a darker color than *D. melanogaster*. It breeds readily in the laboratory, and requires 14-20 days for a generation. Forty mutations have been produced, of which $\frac{1}{2}$ are dominant. Some are very similar to those of other species. Twenty-eight sex-linked mutations have appeared in 23 loci. The linkage groups, of which there are 5, correspond to the haploid number of chromosomes. Non-disjunction of the sex-chromosome was not observed in 309 suitable cultures. Frequent crossing-over between sex-linked characters gives the X-chromosome a total "length" of 170 units. Evidence suggests that the size differences of the X-chromosomes of *D. melanogaster* and *D. obscura* are due to the presence of a large piece of chromosome attached at what corresponds to the left end of the *D. melanogaster* X. Linkage studies indicate that similar genes do not have the same arrangement in *D. obscura*, as in *D. melanogaster*. Descriptions of sex-linked characters of *D. obscura* are presented.—*W. H. Feldman*.

1806. MATHEWS, J. WRENFORD. *Cross-breeding for wool and mutton. Results of experiments*. *Dept. Agric. New South Wales Farmers' Bull.* 132. 61 p., 24 fig., 4 charts. 1920.—The long wool breeds (Lincoln, Leicester, and Border Leicester) are more valuable for mating with the Merino than the down breeds (Southdown, Shropshire, and Dorset Horn). The Merino ewe is to be preferred to the long wool ewe because of environmental conditions. For natural increase the Leicester breed showed 6 per cent superiority to either Lincoln or Border Leicester. The Border Leicester surpassed Lincoln and Leicester as parent in value of lamb carcass for export, in body weight, fleece weight, fleece value, and generally in mutton value.—*L. R. Waldron*.

1807. MENDIOLA, N. B., and J. R. MAGSINO. *Study of bud variation in Codiaeum variegatum*. *Philippine Agric.* 11: 19-22. 2 pl. 1922.—Eighteen varieties of *C. variegatum* (L.) Blume (Croton) were studied and each was subjected to several different treatments of soil and exposure. The author reports that, after 1½ years, a case of terminal and one of lateral bud mutation involving the same shape of leaf, and a change from broad to slender shape, were found in one variety; in this variety, also, a bud mutation involving a change in leaf coloration was found. These variations grew true to type when cuttings were made.—*Sam F. Trelease*.

1808. NACHTSHEIM, H. [German rev. of: SCHMALTZ, R. *Das Geschlechtsleben der Haussäugetiere*. (The reproduction of domestic animals.) 3rd rev. ed., 529 p., 67 fig. R. Schoetz: Berlin, 1921.] *Zeitschr. Indukt. Abstamm.- u. Vererb.* 29: 143. 1922.—Nachtsheim hails this revised edition as of great value to geneticists and others who wish an exhaustive account of the physiology of reproduction of domestic animals. He regrets that in the discussion of the numerous theories of sex-determination no mention is made of the relations of chromosomes to sex.—*Sewall Wright*.

1809. NILSSON-EHLE, H. Über freie Kombination und Koppelung verschiedener Chlorophyllerbinheiten bei Gerste. [Coupling and independent combination of distinct chlorophyll factors in barley.] *Hereditas* 3: 191-199. 1922.—Six factors for chlorophyll development in barley were tested for their genetic relationship. These included 3 factors for white seedlings, 2 for yellow, and 1 for a chlorina type. Only 1 case of linkage was found, that between 1 of the white factors and the chlorina. Deviation from an F_2 ratio of 9 green: 3 chlorina: 4 white seemed to indicate a correlation which was substantiated in the F_3 progenies from green F_2 plants. Instead of a 1:2:2:4 proportion of different progenies, a 0:9:12:126 ratio was found. On the basis of 5 per cent "Koppelung," or crossing-over, the data are in better accord. Factor interrelations between the other chlorophyll factors are discussed.—*E. W. Lindstrom.*

1810. ORTON, J. H. The phenomena and conditions of sex-change in the oyster (*O. edulis*) and *Crepidula*. *Nature* 110: 212-214. 1922.—Of 1 year old oysters, the smaller ones were males and the larger ones were either females or had spawned as females or were changing or had changed into males. The author concludes that all oysters are born males, but may change into females at the age of 1 year. Changes noted were actually observed to occur within 1 year in 1 particular individual. A parallel rapidity in sex-change was observed in *Crepidula*. Probable causes of sex-change are discussed, but it is concluded that the information is insufficient for their determination. The view is favored that the factor for sex-causation is within control of the individual and not in external conditions. Observations are recounted which show that male *Crepidulae* favorably situated with respect to females may function as males for long periods, but when isolated rapidly change to females.—*R. E. Clausen*

1811. PATEL, M. L. Studies in Gujarat cottons. Part I. Mem. Dept. Agric. India Bot. Ser. 11: 75-127. 8 pl., 7 fig. 1921.—Descriptions are given of varieties of *Gossypium herbaceum* grown in Gujarat, India, and of selected strains of the Goghari variety. Heritable characters are enumerated and correlation and variation discussed. The author's conception of the ideal type of *herbaceum* cotton is presented.—*T. H. Kearney.*

1812. PEARL, RAYMOND, AND SYLVIA L. PARKER. Experimental studies on the duration of life. IV. Data on the influence of density of population on duration of life in *Drosophila*. *Amer. Nat.* 56: 312-321. 1922.—The authors find a significant correlation between the length of life of *Drosophila* and the number kept in a bottle. As to the form of the regression line, which appears to be significantly askew, they reach the provisional conclusion that "(a) the lowest density is not the optimum; (b) the mean, duration of life tends to increase with increasing density up to a certain point which is optimum; (c) after the optimum region has been reached, increasing density is associated with diminished duration of life, which presently falls below the lowest figure found with densities below the optimum."—*Sewall Wright.*

1813. PEARL, RAYMOND, AND SYLVIA L. PARKER. Experimental studies on the duration of life. V. On the influence of certain environmental factors on duration of life in *Drosophila*. *Amer. Nat.* 56: 385-405. 1922.—The authors find that the mean duration of life for *Drosophila* of wild type is about 10 per cent greater in bottles which allow free ventilation in the mouth than in bottles with cotton plug stoppers. No effect of ventilation was found in a relatively short-lived stock with vestigial wings and other recessive characters. The feeding of embryonic juice, either from the chick or from the larvae of *Drosophila*, was without effect on longevity.—*Sewall Wright.*

1814. PEARL, RAYMOND, AND SYLVIA L. PARKER. On the influence of density of population upon the rate of reproduction in *Drosophila*. *Proc. Nation. Acad. Sci. [U.S.A.]* 8: 212-219. 1 fig. 1922.—Matings were made (in standard half-pint bottles containing constant volume of food) with different numbers of parent flies varying from 1 to 50 pairs per bottle. The progeny from these matings were counted and the rate of reproduction—per female per day—obtained for each density. The rates were found to decrease very regularly as the density of

the parental population increased. A graph is given showing the goodness of fit of the curve, $\log y = a - bx - c \log x$, fitted by least squares to the series of points. The relation between this curve and Farr's Law relating death rate to density of population is discussed.—*Sylvia L. Parker.*

1815. PHILLIPPS, W. J. **Hybridism of *Salmo irideus* and *Salmo fario* in Australasia.** New Zealand Jour. Sci. and Technol. 5: 98-100. 1922.—This is a discussion of all work on trout hybridization in Australasia and a tabulation of results in detail obtained from crossing brown and rainbow trout both ways. Rainbow ♂ × brown ♀ may under certain conditions cross, while the reverse cross is less likely to materialize. Hybrids as compared with parents have minimum vitality and except in rare cases would not successfully compete with parents. They are often abnormal and frequently die a few days after the yolk-sac is absorbed. In rare instances, hybrids develop to sexual maturity, but whether progeny of F₁ hybrids could continue the race is unknown.—*Orland E. White.*

1816. PLATH, O. E. **Notes on the hybrids between the canary and two American finches.** Amer. Nat. 56: 322-329. 1922.—The following crosses are reported: yellow canary × California linnet, yellow canary × willow goldfinch, and willow goldfinch × Arkansas goldfinch. Results indicate that dark color is dominant to yellow. Earlier observations by others that mottling in such hybrids is due to a gene carried only by canaries was not confirmed.—*F. A. Hays.*

1817. RUEDEMANN, RUDOLF. **Additional studies in arrested evolution.** Proc. Nation. Acad. Sci. [U.S.A.] 8: 54-55. 1922.—A brief statement is presented of an investigation of the possible influence, recorded in the fossils, of the different modes of propagation upon the persistence of types.—*R. Ruedemann.*

1818. RUEDEMANN, RUDOLF. **Further notes on the paleontology of arrested evolution.** Amer. Nat. 56: 256-272. 1922.—In continuation of his previous studies of the causes of persistence in animals, the writer had investigated the possible influence of the different modes of propagation upon the persistence of types and had found that all the lower modes of propagation, viz., propagation by simple division, by budding, by hermaphroditism, and by parthenogenesis, are distinctly favorable to persistence, mainly through diminution in the frequency and range of variability as far as it is induced by fertilization. A clue to the mechanics of the processes involved in persistence is believed to be found in the views recently advanced by Dürken and Salfeld on the methods of inheritance and production of new characters by means of the genes or character-determiners of the heredity-chromatin [see Bot. Absts. 11, Entry 2431]. These authors hold that external influences act first upon the cytoplasm, which in part directly influences the heredity-chromatin and in part is changed by long-continued strain, by way of inceptive genes (plasmogenes), into true genes. The conditions which produce persistent types are not able to stimulate the cytoplasm sufficiently to lead to the formation of new genes.—*R. Ruedemann.*

1819. SEREBROVSKY, A. S. **Crossing-over involving three sex-linked genes in chickens.** Amer. Nat. 56: 571-572. 1922.—The genes suke (slow feathering), trage (barring), and tuge (silver) were studied. All 3 are present in Barred Plymouth Rocks, whereas the Russian Orloff chickens have none of them. All are sex-linked. A cross gave in F₁ all Barred Rock type of males slow feathering and all black females that developed feathers rapidly. Cross-overs occurred in these F₁ males so that in F₂ the Plymouth Rock color was combined with quick feathering and black color with slow feathering. One suke-tuge-atrage chick appeared, being slow-feathering and silvery but non-barred.—*F. A. Hays.*

1820. SHAMEL, A. D. **Recent bud-selection work in citrus and other industries.** California Citrograph 7: 358, 370-371, 386. 3 fig. 1922.—Some bud variations are inherited, while others are transitory effects of the environment. In various cases reviewed (apple, potato,

sugarcane, citrus), superior individuals within a clonal variety have given superior progeny. The author's bud-selection work aims to (1) secure improved varieties; (2) isolate improved strains of established varieties; (3) improve the average performance of valuable strains. In sugarcane, superior "stools" (plants) are selected and propagated. "In progenies grown from such selected stools less than 1 in 100 have proved to be inherently stable." About half of the world's sugarcane sugar is produced by "varieties which originated as bud mutations." Two lemon orchards propagated from high-yielding trees are mentioned; there are no control trees, but the orchards are remarkable for their uniformity and for their early and high production. In comparative tests, "evidence has been secured that the superior and inferior strains of our citrus varieties can be isolated by bud selection. Furthermore, the progenies of the highest-yielding parent trees have thus far given us the highest and best yields, while the progenies of the low-yielding parent trees of these same strains have given us the lowest and most undesirable yields."—*Howard B. Frost.*

1821. SINNOTT, EDMUND W. Inheritance of fruit shape in *Cucurbita pepo*. Bot. Gaz. 74: 95-103. Fig. 1-3. 1922.—Starting with commercial varieties the author was able to isolate through inbreeding a number of contrasting pure lines. The tendency toward sterility in most cases was found to disappear by the 4th generation. The cross of a certain spherical type ("sphere") with 3 varieties of the flat fruit type ("disc") indicated definite dominance of the latter with but 1 factor functioning. In 2 of the crosses the author obtained spheres in the F_2 which were decidedly flatter than the parent sphere type and the discs also were decidedly deeper than the parent disc type. This condition of things, it is pointed out, may readily be explained "by assuming that there is a second dominant flattening factor, considerably weaker in its effect than the major one [mentioned above] and segregating independently of it." Since the squashes which are longest are also those which are narrowest (the sphere type) and those which are thinnest are also those which are widest (the disc type) it is held "that shape determining factors actually exist, and that the facts here set forth are not due merely to the segregation of size factors."—*B. W. Wells.*

1822. SINNOTT, EDMUND W., AND ALBERT F. BLAKESLEE. Structural changes associated with factor mutations and with chromosome mutations in *Datura*. Proc. Nation. Acad. Sci. [U. S. A.] 8: 17-19. 1922.—Of the 3 gene mutants in *Datura*, the white-flowered form showed no structural differences; the smooth-capsuled form differed from the normal in having sharper angles, shorter internodes, thicker stems, and greater difference between the 2 branches at a fork; while the few-noded form had shorter main stem, shorter internodes, thinner stems, and greater difference between the 2 branches at a fork. Of the 12 forms with an extra chromosome each, Reduced had a shorter main stem, sharper angles, and thinner stems; Cocklebur had wider angles, thinner stems, and shorter internodes; Globe showed shorter internodes, thicker stems and more difference between the 2 branches at a fork; while Buckling had wider angles than the normal. Differences in the wood fibers, the vessels, and the sclerenchyma were also noted. The tetraploid plants also showed definite external and internal differences from the normals.—*John Belling.*

1823. SPINKS, G. T. Fruit breeding investigation. Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. 1920: 61-65. 1920.—Notes are presented on the progeny of crosses between varieties of apples, pears, plums, cherries, currants, gooseberries, raspberries, strawberries, and tomatoes.—*W. H. Chandler.*

1824. STEIN, EMMY. Über den Einfluss von Radiumbestrahlung auf Antirrhinum. [Effect of radium-rays on Antirrhinum.] Zeitschr. Indukt. Abstamm.- u. Vererb. 39: 1-15. 1922.—The growing point of shoots of *Antirrhinum*, variety "Delila" from Baur's cultures, were exposed for varying lengths of time to a radium preparation consisting of 30.2 mgm. radium-barium-sulphate enclosed in a glass tube imbedded in a platinum capsule. Of the 3 types of rays emanating from this preparation, only the β and γ were active, the latter being the most effective. Exposures were made in a dark room. Exposures of 5-10 minutes had no percep-

tible influence. Exposures of 20-160 minutes checked growth temporarily and caused floral abnormalities of several types; later the plants resumed normal behavior. Exposures on a 2nd series varying from 2 to 72 hours produced another type of abnormal behavior. In all the experiments of this type abnormal behavior was temporary and results were negative as far as producing mutants is concerned.—The author also exposed seed of *Antirrhinum* from Baur's cultures; the technique is given in detail. All seed exposed 45 minutes germinated. Longer periods of exposure resulted in decreased percentage of germination in proportion to length of exposure. Seed exposed 1.5 hours produced seedlings with small, white, wrinkled cotyledons. Still longer exposures gave plants with undeveloped cotyledons and a high mortality. In other cases the vegetative point failed to develop. In still others the flowering period was greatly retarded. A large number of plants from exposed seed showed only cotyledon injury and 10 of these at flowering time were selfed and "bagged" and exposed to radium rays, resulting often in sterility. Some of the aberrant forms ("radium-plants") produced by the exposed seed are regarded as true mutants, as no such plants ever arose among the controls. These forms, though largely sterile, in a few cases gave rise to progeny which resembled them, and in one case this resemblance was repeated to the 2nd generation. When propagated by cuttings these "radium-plants" preserved their characters faithfully, though single branches often reverted to normal except for their sterility. Most important aberrant types were: (1) forms with small, "horn tipped" leaves, luxurious growth, pale flowers; (2) forms with small leaves and elongated flowers; (3) forms defective in form and color of leaves and flowers, flowers split with parts undeveloped or grotesque in shape; (4) dwarf forms (6-8 cm.), flowerless, small leaves, and shortened internodes. Flowerless dwarf form of this type was also secured from pollination of normal with pollen that had been exposed.—C. S. Gager.

1825. TANAKA, TYOZABURO. A new feature of bud variation in *Citrus*. U. S. Dept. Agric. Dept. Circ. 206. 8 p. 1922.—The Wase variety of Satsuma orange (*Citrus nobilis* Lour. var. *unshiu* Swingle) is probably the result of bud variation, some explanations of which are as follows: (1) bud variation may be the same as germinal mutation; (2) somatic segmentation of a Mendelian recessive; (3) periclinal chimeras. References numbering 23 are appended.—L. R. Hesler.

1826. TANAKA, Y. Sex-linkage in the silkworm. Jour. Genetics 12: 163-178. 1 pl. 1922.—The author describes a sex-linked recessive, translucent skin in the caterpillar. The female is heterozygous for sex as in other Lepidoptera. Three exceptional males, perhaps due to non-disjunction, were observed. He states that there are also at least 7 non-sex-linked genes, all recessive, that cause various degrees of translucence in caterpillars. Crosses are reported of sex-linked to non-sex-linked translucents, with complex F_2 ratios, that agree sufficiently well with the expectations.—A. H. Sturtevant.

1827. TOENIENSEN, E. Ueber die Entstehung erblicher Eigenschaften durch cytoplasmatische Induktion. [On the origin of hereditary characters through cytoplasmic induction.] Zeitschr. Indukt. Abstamm.- u. Vererb. 29: 16-25. 1922.—Cytoplasmic induction is the transmission to, or induction in, the germ plasm of changes produced in the cytoplasm by some outer stimulus. *Bacterium pneumoniae* under strong influence of its own metabolic products is made to produce 3 mutants. Mutant III has practically no virulence. Virulence is restored to half its original value by 80 mouse passages. Upon further cultivation on agar these mutants with restored virulence lose some, but not all, of it. Thus it appears that during the mouse passages virulence was being gradually restored, but more rapidly to the cytoplasm than to the germ plasm. The amount of regression on agar represents the cytoplasmic modification which had not yet been impressed on the germ plasm. Therefore the character is first impressed on the cytoplasm which then passes it on to the germ plasm.—H. M. Smith.

1828. VENKATRAMAN, T. S. A simple pollinating apparatus. Agric. Jour. India 16: 203-206. 1 fig. 1921.—A method is described and figured of pollinating sugar-cane by collecting pollen in a gelatin capsule, which is inserted in the free end of the rubber tube of a blowing

bulb. The capsule is then punctured lengthwise with a needle and pressure on the bulb releases a spray of pollen. The author mentions a method of testing viability of sugar-cane pollen by germination on stigmas of a species of *Datura*.—*T. H. Kearney*.

1829. WEBBER, H. J. *Citrus root-stock problems*. California Citrograph 7: 391, 408-411. 7 fig. 1922.—This is a general discussion, with conclusions and recommendations about as in a previous publication [see Bot. Absts, 5, Entries 498-1785.] In the orchard test of large, intermediate, and small nursery trees the average size differences in 1922 were, with 1 slight exception, in the same sense as in 1919 (previously reported), and markedly in favor of the larger nursery trees. The large trees have also decidedly exceeded the smaller ones in yield. Similar results are now reported for a commercial orchard of 60 acres, of which successive thirds were planted respectively with large, intermediate, and small Valencia orange trees from the same nursery rows. Both commercial varieties and selected stock seedlings in orchard planting show great differences in size and vigor as well as in other characteristics; in view of this fact it is very probable that the persistent size differences among young budded trees are largely due to genetic differences among the stocks.—*Howard B. Frost*.

1830. WRIGHT, SEWALL. *Coefficient of inbreeding and relationship*. Amer. Nat. 56: 330-338. 1922.—Pearl has built up a coefficient of inbreeding based on the smaller number of ancestors in each generation back of an inbred individual as compared with the maximum possible number, and a partial inbreeding index which brings in coefficients of relationship between ancestors. The author suggests that a more direct measure of the effects of inbreeding may be obtained from the percentage of homozygosis which would follow on the average from a given system of mating, taking a formula which makes the coefficient run from 0 to 1 while the percentage of homozygosis is running from 50 to 100 per cent. The various formulae are developed from the method of path coefficients discussed by the author in a series of papers [see Bot. Absts. 10, Entries 143, 144, 145, 146, 147].—*Sylvia L. Parker*.

1831. ZADE. [German rev. of: (1) FRUWIRTH UND ROEMER. *Einführung in die landwirtschaftliche Pflanzenzüchtung*. (Introduction to agricultural plant breeding.) 150 p., 4 pl., 27 fig. Paul Parey: Berlin, 1921.] (2) BAUR, ERWIN. *Die wissenschaftlichen Grundlagen der Pflanzenzüchtung*. (The scientific principles of plant breeding.) 111 p., 6 pl., 11 fig. Gebrüder Borntraeger: Berlin, 1921 (see Bot. Absts. 12, Entry 1034).] Zeitschr. Indukt. Abstamm. -u. Vererb. 29: 139-140. 1922.—[See also Bot. Absts. 12, Entry 1784.]

HORTICULTURE

J. H. GOURLEY, *Editor*

(See also in this issue Entries 1562, 1585, 1600, 1623, 1626, 1631, 1775, 1776, 1820, 1823, 1825, 1829, 1982, 2129, 2132, 2134, 2157, 2158, 2159, 2218)

FRUITS AND GENERAL HORTICULTURE

1832. ANONYMOUS. [Report by the Netherlands Minister to China.] *Iets over de thee-cultuur in China*. [Note on tea culture in China.] De Thee 2: 53-54. 1921.—Tea is not cultivated in China on the same basis as in Ceylon, British India, and Java. It is rather a by-crop, grown in mixture with other crops, or on the dykes of rice fields. Direct seeding is practiced rather than the planting out of nursery stock. There is no pruning worthy the name. Picking is done only during about 3 weeks of the year, and by no special system. It is seldom that more than 3000 bushes are found under 1 ownership, and the factories have no control over the raw product. Better methods of handling the product must be practiced before Chinese tea can regain its importance in the market.—*Carl Harlley*.

1833. ANONYMOUS. *Sixteenth annual report of the government cinchona plantations and factory in Bengal for the year 1921-22*. 4 + xii p. Bengal Secretariat Book Depot; Calcutta,

1922.—The report gives the acreage in *Cinchona Legeriana*, and *C. succirubra* on different plantations as well as notes on the percentage of quinine secured, cost of production, extraction, packing, etc., including a detailed financial statement.—*A. J. Pieters*.

1834. ALLEN, W. J., and W. LE G. BRERETON. The packing of fruit. New South Wales Dept. Agric. Farmers Bull. 130. 46 p., 50 fig. 1920.—Detailed descriptions and illustrations are furnished for packing apples in the standard Australian bushel case. Variations in tiers, packs, and row counts allow for 21 different counts ranging from 45 to 210 fruits per case. Packing in the Canadian case is also illustrated and discussed. Brief notes are given for packing pears, peaches, and citrus fruits in cases and half cases. Eight standard packages are described in detail.—*L. R. Waldron*.

1835. BALLOU, F. H. Lessons from 1921 orchard work. Ohio Agric. Exp. Sta. Monthly Bull. 7: 63-67. 1922.—The author mentions briefly a few of the effects from neglect in spraying in southeastern Ohio due to the failure in the fruit crop. Observations are also given regarding the resistance of certain varieties to spring freezes.—*R. C. Thomas*.

1836. BALLOU, F. H. Response of sweet clover to phosphatic fertilizer. Ohio Agric. Exp. Sta. Monthly Bull. 7: 68-72. Fig. 1-3. 1922.—The conditions under which the test was conducted are briefly outlined. Certain advantages and disadvantages of sweet clover in orchard culture are mentioned. A test comparing the value of nitrate of soda alone at the rate of 200 pounds per acre, also with the addition of a similar amount of acid phosphate, demonstrated a very marked increase in yield of sweet clover due to the phosphatic fertilizer.—*R. C. Thomas*.

1837. BALLOU, F. H. Spraying hillside orchards. Ohio Agric. Exp. Sta. Monthly Bull. 7: 82-87. Fig. 1-5. 1922.—The writer presents methods of overcoming difficulties in spraying hillside orchards in southern Ohio. Special reference is made to the terraced roads and water supply. The illustrations accompanying the article are aptly chosen.—*R. C. Thomas*.

1838. BARKER, B. T. P. Root development in newly planted trees. Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. 1920: 43-60. 1920.—This reports a study of root growth during the 1st year in the orchard of trees planted in the following ways: (1) root fibers retained, tree unrammed, branches pruned; (2) root fibers retained, tree unrammed, branches unpruned; (3) root fibers retained, tree rammed, branches pruned; (4) root fibers retained, tree rammed, branches unpruned; (5) root fibers removed, tree unrammed, branches pruned; (6) root fibers removed, tree unrammed, branches unpruned; (7) root fibers removed and roots cut, tree unrammed, branches pruned; (8) root fibers removed and roots cut, tree unrammed, branches unpruned; (9) root reduced to short stump, tree unrammed, branches pruned; (10) root reduced to short stump, tree unrammed, branches unpruned. All were apple trees on Paradise roots. Trees having different root treatments were also planted in sand and others were grown with the roots in water.—With the trees in open ground there was no apparent difference in top growth on the different plots. Regardless of the treatment given very few new roots were formed except from that part of the main stock within 3-4 inches of the surface of the soil; this was true of 29 of the 30 trees lifted. New roots started from the older ones of 1 tree; this, it is thought, could not have been true Paradise stock.—With the trees growing in sand, new roots started from older roots from base to end. Apparently the larger number of new roots started near wounds made on the roots. As in the case of trees growing in soil the treatment of the roots at planting seemed to have no important influence on the character of the new root system.—The roots growing in water showed very great enlargement or callous-like growths of the lenticels. Both new root growth and this growth of lenticels slackened toward the end of the growing period, finally ceasing. The roots were then less resistant to the fungus growing upon them.—*W. H. Chandler*.

1839. BARKER, B. T. P., and A. H. LEES. Factors governing fruit-bud formation. (Pruning.) Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. 1920: 19-42. 1920.—The paper

reports results of a study of the effect on fruit-bud formation of the method of pruning trees on supports advocated by Lorette in his book of 1913 (*La Taille Lorette*). It is naturally a study of very severe summer pruning. Thus, for wood shoots of 1 year's growth only, Lorette recommends cutting to 1-2 leaves at the base when the shoots are about the thickness of an ordinary lead pencil at the base, or about 10-12 inches long, or just beginning to lignify at the base; and for wood of more than 1 year's growth (short piece of wood of 1 or more year's growth) he recommends leaving 1 wood shoot (the weakest) and cutting it to 1 visible eye. He recommends leaving spurs and cutting to 1 eye any wood shoot that may be present. For treatment of twiggy shoots (*Brindilles*) he recommends cutting to 3 eyes or bending downward, and for the "bourses" or "knobs" (cluster bases), cutting to the basal leaf or to 2 visible eyes any wood shoots arising. The authors summarize their experience at Long Ashton (England) as follows: "(a) Pruning hard to obtain stipulary eyes for flower formation is very unsatisfactory. (b) Pruning to the basal cluster where present is far better, but results in occasional failures. (c) Where no basal cluster exists a cut to two visible eyes, not three, should be made. (d) The time of year, the state of lignification at the base and the presence or absence of basal clusters should be used for criteria rather than the length or thickness of the shoot. (e) *Brindilles* should be cut to two eyes where they cannot be safely left, not to three. The bending down method is hopeless except for a garden. (f) Shoots from bourses should be cut as close as possible, if carrying fruit; if not, treatment should be according to whether large dards are present or not." The results are discussed in relation to the theory of Loeb that growth inhibiting substance moves backward from the terminal portions of growing shoots. The authors think that results with this Lorette system of pruning are in agreement with Loeb's theory. Suggestions for practice in sections with rather humid climates like that of Long Ashton are given.—*W. H. Chandler.*

1840. [BERNARD, CH.] *Groenbemesters*. [Green manures.] *De Thee* 1: 100-101. 1920.—Ten reasons are given for the tea experiment station's regular recommendation that green manures be planted between the tea.—*Carl Hartley.*

1841. BERNARD, CH. *Het teeren van snoeiwonden*. [The tarring of pruning wounds.] *De Thee* 1: 15-17. 1920.—Tests were made on tea pruning wounds of 2 tars from a local petroleum company, 1 from a gas factory, and 1 from an unknown source. Application was delayed 1-2 days after pruning to allow the surfaces to dry. The petroleum "tars" proved variable, and consisted probably of asphalt dissolved in a light petroleum. The coal tar and the unknown tar penetrated deeply, especially in the cambium and bast regions, presumably due to phenol compounds. Discarding the yellow oil found separated out in the tins, and washing the residue with water before using, decreased the injury. The brownish tar from the petroleum company failed to cover the exposed wood properly. The black petroleum tar made a good cover, and at the end of a year good callus growth was noted. The results confirm earlier tests in showing the undesirability of phenol-containing tar-like substances for wound treatment.—*Carl Hartley.*

1842. [BERNARD, CH.] *Hoe lang blijft een thee-aanplant productief?* [How long does a tea plantation remain productive?] *De Thee* 1: 14-15. 1920.—Tea gardens that are well cared for should show no permanent diminution of yield up to the age of 20-30 years. A case of marked increase in yield following pruning and fertilization with boengkil (peanut or kapok seed cake), bone meal, and wood ashes is described.—*Carl Hartley.*

1843. [BERNARD, CH.] *Sesbania als groenbemester*. [*Sesbania* as a green manure.] *De Thee* 1: 18-19. 1920.—*Sesbania aegyptiaca* has given good results on some tea plantations, including places where lamtoro (*Leucaena glauca*) will not grow. It is a small tree, with light shade, easily propagated, and fast growing. Natives (in West Java) use its seed as a substitute for coffee, its foliage for fodder; they obtain a diuretic extract from the leaves, and in sections deficient in wood the tree serves as a source of fuel.—*Carl Hartley.*

1844. BERNARD, CH. *Verpakking van Formosa-thee*. [Packing of Formosa tea.] Dept. Landb. Nijv. en Handel [Nederland.-Indië] Proefsta. Thee Mededeel. 71. 3 p. 1920.—Formosa tea shippers by more careful grading and more durable packages have gained an advantage over Java tea shippers in the U. S. A. market.—*Carl Hartley*.

1845. BERNARD, CH. *Verslag van het Algemeen Proefstation voor Thee over het jaar 1920*. [Report of the General Experiment Station for Tea for the year 1920.] Dept. Landb. Nijv. en Handel [Nederland.-Indië] Proefsta. Thee Mededeel. 74. 64 p. 1921.—Brief report of the activities of the station, including those of the chemist, botanist, and agriculturist. The working plan and budget are given for 1921.—*Carl Hartley*.

1846. BERNARD, CH. *Verslag van het Proefstation voor Thee over het jaar 1919*. [Report of the Experiment Station for Tea for the year 1919.] Dept. Landb. Nijv. en Handel [Nederland.-Indië] Proefsta. Thee Mededeel. 69. 23 p. 1919.—This is the administrative report for 1919, budget for 1920, and report of the experimental garden, showing graphically the monthly yield and parallel rainfall and sunshine observations.—*Carl Hartley*.

1847. BERNARD, CH., en C. P. COHEN STUART. *De theecultuur in Japan en in de Shanlanden*. 1. Enkele aantekeningen betreffende de theecultuur in Japan. 2. Gegevens betreffende de theecultuur in Siam en Burma. [Notes on tea culture in Japan, Siam, and Burma.] Dept. Landb. Nijv. en Handel [Nederland.-Indië] Proefsta. Thee Mededeel. 73. 34 p., 7 fig., 2 maps. 1920.—In addition to the Dutch text are given as appendices a letter in English from the Director of Agriculture of Burma describing the tea culture there; and a list, with accompanying maps, of places in Burma where either wild or cultivated tea is known to occur.—*Carl Hartley*.

1848. BERNARD, CH., en M. KERBOSCH. *Voorloopige mededeeling omtrent het verenten van thee*. [Preliminary communications on the grafting of tea.] De Thee 1: 97-100. 2 pl. 1920.—Graftage is a promising method of perpetuating selected seed-stock. It has not been tested long enough to determine how much productiveness depends on root system and how much on the quality of the top. Ten years' experience however indicates that grafted plants, aside from growth vigor, have the habit and other characters of the scion parents. It is much more difficult to get successful grafts in tea than in *Cinchona*, methods which give 98 per cent with *Cinchona* succeeding in 20 per cent or less of the attempts with tea, the same experienced workers having been employed for both. Crown grafting, by a method illustrated in detail drawings, gave 50 per cent good unions and subsequent strong growth. Marcotting (girdling scion branches and letting them develop their own roots in balls of earth before removing them from the parent tree) gives good results and will be useful in selection work, though not adapted to large-scale operations.—*Carl Hartley*.

1849. BIOLETTI, FREDERIC T. *Some common errors in vine pruning and their remedies*. Univ. California Agric. Exp. Sta. Circ. 248. 8 p. 1922.—It is almost impossible to find 2 vines that should be pruned in exactly the same manner. Some of the errors in pruning are: (1) Failure to modify the pruning according to the strength of the vine or cane. This results in irregular crops and a decrease in quality. (2) Serious injury to the vine or its destruction by attempting to obtain excessive crops without regard to the annual growth. (3) Adopting systems which in their nature can not be permanent, i.e., vertical canes and vertical cordons.—*A. R. C. Haas*.

1850. BORZA, A. *Flora grădinilor țărănești române*. I. Mărul (*Pyrus Malus* L.) [The flora of the Roumanian peasant garden. I. The apple tree.] Bul. Inform. Grăd. Bot. Muz. Bot. Univ. Cluj 1: 64-87. 1921.—In this contribution are scientifically studied for the first time the apple types of Roumania. As a type *Malus pumila* Mill. is especially concerned in its varieties *domestica* C. K. Schneider and *dasyphylla* A. & G. Besides, there are forms which may be derived from *M. sylvestris* Mill. On the other hand, kinds derived from *M. baccata*

Borkh. are rare, and from *M. astracantha* Dum.-Cours. and *M. prunifolia* Borkh., it is scarcely possible to recognize descendants. In addition to a catalog of 150 local types, there are 27 types improved by the Saxons, Szklers and Magyars and 9 types of recent importation.—*M. Tiesenhausen*.

1851. BRADFORD, F. C. The relation of temperature to blossoming in the apple and the peach. Missouri Agric. Exp. Sta. Res. Bull. 53. 51 p., 5 pl., 4 fig. 1922.—The author presents data on temperature accumulation to the time of blossoming of peach and apple at several stations. The amount of heat measured in day-degrees received by peaches from Jan. 1 to blossoming varies with the season and varies more with the locality. Microscopic examination of the blossom buds of apple indicates different stages of advancement in the fall and different rates of development during winter in different varieties. Observations on branches forced in the greenhouse indicate that late blossoming in the apple is connected with rest period influence rather than different temperature requirements. Similar differences between varieties of peach seem to be masked at Columbia, Missouri.—*O. W. Letson*.

1852. BRADFORD, F. C., and H. A. CARDINELL. Observations on winter injury. I. Early and late winter injury. II. An aftermath of winter injury. Missouri Agric. Exp. Sta. Res. Bull. 56. 26 p., 8 pl. 1922.—I. The killing of fruit buds in the apple occurred early in 1921 and 1922. The Jonathan variety appeared to be injured to the extent of about 10 per cent, while other varieties were injured noticeably less or not at all. The evidence indicates that the injury was due to immaturity. The 2nd bloom was shown not be a result of injury to the normal bloom.—II. This portion of the bulletin contains observations made on a young orchard planted from nursery stock that had been injured by low temperature, while the more resistant cambium was not destroyed. When the trees were pruned they did not heal properly and several fungi gained entrance. Recommendations for dealing with such cases are given.—*O. W. Letson*.

1853. BUNYARD, E. A. Variegated fruits. Gard. Chron. 72: 168-169. 1922.—Cases of variegation in the fruits of orange, lemon, pear, apple, grape, currant, and gooseberry are noted. These variegations are found in green, red, pale, and yellow colors. In some varieties 3 of these color forms are known. These are supposed to originate as bud sports, and may occur in more than 1 locality, and for this reason claims for exclusive right of propagation can not be maintained.—*P. L. Ricker*.

1854. CARPENTER, FORD A. The trustworthiness of thermometers used by California fruit growers. Bull. Southern California Acad. Sci. 21: 21-27. Fig. 1-3. 1922.—The thermometers used by southern California fruit growers, especially since the war, have been noticeably inaccurate, only 6 per cent of those submitted to the practical research department of the Los Angeles Chamber of Commerce being accurate. Because of this inaccuracy great expense has been occasioned the fruit growers because of smudging when it was unnecessary. The sources of error, methods of calibration, proper placing of the thermometers in the orchard, and types of thermometers are discussed.—*Roxana Stinchfield Ferris*.

1855. CASTELLA, F. DE. Spring grafting of old-established vines. Jour. Dept. Agric. Victoria 18: 610-614, 680-687. Fig. 1-7. 1920.

1856. CASTELLA, F. DE. Twenty years of reconstitution. Jour. Dept. Agric. Victoria 18: 481-492. 1920.—This is a plea for the use of American vine stocks to combat the attacks of *Phylloxera*. The mild climate of Australia is favorable for success with *Phylloxera*-resistant stocks, especially if the best varieties are chosen and the soil carefully prepared. The effect of stock on scion is also discussed.—*Wm. E. Lawrence*.

1857. CHEVALIER, AUG. Comptes rendus du premier congrès du châtaignier. [An account of the first chestnut congress.] Rev. Bot. Appl. 1: 375-380. 1921.—A number of recent papers on the chestnut are reviewed.—*Paul Russell*.

1858. COHEN STUART, C. P. *De theezaadtuinen van Java en Sumatra*. [The tea seed gardens of Java and Sumatra.] Dept. Landb. Nijv. en Handel [Nederland.-Indië] Proefsta. Thee Mededeel. 75. 32 p., 13 fig. 1921. [With English summary.]—Tea seed growing is profitable, but when the 1,380 acres now in seed gardens become of full bearing age the local market will be over supplied and the poorer gardens forced out. The utilization of the seed of such gardens for oil extraction is suggested. A period of approximately $1\frac{1}{2}$ years intervenes between the formation of buds and the ripening of the seed, so that direct relation between climatic conditions and yield is not easily traced. In order to ensure full maturity, the taking of seed only after its fall from the tree is advised. Criteria for the selection of seed-tree stock are not yet absolutely established.—*Carl Hartley*.

1859. [COHEN STUART, C. P.]. *Hooge productie door zorgvuldigen pluk en insektenbestrijding*. [High production by careful picking and insect control.] *De Thee* 2: 5-7. 1921.—High yields at a Java tea plantation which picks only the pecco and 2 next leaves are reported. Extensive tests show that of the 4-leaf picking these first 3 leaves constitute 60 per cent by weight, the 4th leaf 26 per cent, and the oldest internode 14 per cent. Three-leaf picking however yields 66 per cent of the yield obtained in 4-leaf picking, due to the axillary bud of the leaf left on the plant.—*Carl Hartley*.

1860. COHEN STUART, C. P. *Iets over de middelen om oogstvermeerdering te verkrijgen*. [On the methods of getting increased yields.] *De Thee* 1: 46-49. 1920.—Brief consideration is given of picking system, soil conditions, pruning system, spacing, shade, disease control, and the hereditary qualities of the tea plants. The author has shown that a picking system including pecco and 1 leaf gives 200-300 per cent more yield than if the pecco only is taken; pecco and 2 leaves give a further increase of 150-200 per cent; 100-130 per cent further increase by a p+3 system; and 60-80 per cent further increase by a p+4 system.—*Carl Hartley*.

1861. COHEN STUART, C. P. *Nog iets over pluktermen*. [Something more about picking terms.] *De Thee* 1: 8-13. 1920.—This is an explanation of a number of terms, mainly Sundanese, in use in the Java tea industry.—*Carl Hartley*.

1862. COHEN STUART, C. P. *Snoeitermen*. [Pruning terms.] *De Thee* 2: 33-45. 3 fig. 1921.—Eight types of pruning are figured, and for each are given the Dutch and native names in use in West Java, and in some cases also the English name. Various Sundanese terms connected with pruning are also translated into Dutch, as for example the names of different kinds of branches, of pruning instruments, and of different methods of making the pruning cuts. Details of the different ways of making the individual cuts are illustrated.—*Carl Hartley*.

1863. [COHEN STUART, C. P.]. *Verzameling van leguminosen en onkruiden*. [Collection of legumes and weeds.] *De Thee* 2: 7-8. 1921.—The General Experiment Station for Tea [Buitenzorg, Java] is developing a herbarium including types and developmental stages of tea, relatives such as *Camellia* spp., the legumes used as green manures on tea estates, and the commoner weeds.—*Carl Hartley*.

1864. COLLINS, JAMES H. *How does fruit get damaged en route?* *Florida Grower* 26¹⁰: 6-7. 1 fig. 1922.—This is a general consideration of the strength of fruit boxes and types of nails and wood being used. The handling of boxes in fruit cars and their condition during transit until they reach the market are also discussed.—*J. C. Th. Uphof*.

1865. CRIDER, F. J. *The olive in Arizona*. *Arizona Agric. Exp. Sta. Bull.* 94. 493-528. 1922.—The author emphasizes the best practices in successful olive culture, based on investigations made by the Arizona Experiment Station during the past 26 years. The statement is made that Arizona may become one of the great olive-producing centers of the world because of the ideal climatic and soil conditions, absence of serious diseases and insects, and quality of the fruit produced.—*Herbert C. Hanson*.

1866. DEUSS, J. J. B. Aluminium in plaats van lood voor theeverpakking. [Aluminum in place of lead for tea packing.] De Thee 2: 24. 1921.—Aluminum is to be recommended. It has been shown however that lead is not dangerous for use in tea packing, as even mouldy tea in lead cases is entirely free from lead.—*Carl Hartley*.

1867. DEUSS, J. J. B. De oolong thee van Formosa. [The oolong tea of Formosa.] De Thee 2: 19-23. 1921.—The history and relatives of this tea are described, and a general account of tea culture in Formosa is given.—*Carl Hartley*.

1868. DEUSS, J. J. B. De verpakking van Java-thee. [The packing of Java tea.] Dept. Landb. Nijv. en Handel [Nederland.-Indië] Proefsta. Thee Mededeel. 71. 4-12, 14 fig. 1920.—Needed improvements in packing cases and packing methods are described.—*Carl Hartley*.

1869. DEUSS, J. J. B. Grondbedekking in theetuinen. [Mulching in tea gardens.] De Thee 1: 106-107. 1920.—Mulching with all sorts of available plant material has been tested on a large scale in a Java plantation, and the results appear excellent. Good physical condition, addition to soil humus, and weed control result. Alangalang, a coarse grass, is much employed; by laying the cut blades along the soil contours erosion is prevented.—*Carl Hartley*.

1870. DYKHUIS, J. Italian fruit stocks. Nation. Nurseryman 30: 312, 314. 1922.

1871. ELLENWOOD, C. W. Notes on five year results of apple pruning. Ohio Agric. Exp. Sta. Monthly Bull. 7: 58-61. 1922.—In an experiment to determine the relative value of no pruning, light summer pruning, light dormant pruning, heavy pruning, pruning after foliage appears, and light dormant pruning, it was found that the last method gave the most satisfactory result. The 5-year results from the various types of pruning, including in each plot 10 trees, are expressed in tabular form showing the number of pounds of fruit produced in each case classified as "firsts," "seconds," and total yield.—*R. C. Thomas*.

1872. G[ARRETSSEN], A. J. Tijdelijk verlaten theetuinen. [Temporarily abandoned tea gardens.] De Thee 2: 51-53. 1921.—The malaise has forced the temporary or partial abandonment of certain tea plantings. To prevent the development of jungle, difficult to eradicate when management is resumed, it is advised that gardens temporarily abandoned be first planted to some legume tall enough to shade out weeds, even though it also somewhat shade the tea. *Cajanus indicus* is recommended as a valuable fodder plant as well as soil improver. *Tephrosia candida* is less desirable because of slow growth, but can be used on poorer soils than the *Cajanus*. *Sesbania aculeata* does very well for the 1st year, but later not so well.—*Carl Hartley*.

1873. GEORGESON, C. C. Report of work at Sitka station. Rept. Alaska Agric. Exp. Sta. 1920: 12-20. Pl. 1. 1922.—According to this report some nursery stock suitable for Alaskan conditions was distributed and strawberry breeding work was continued. The growing of raspberries, currants, and gooseberries is reported. A hybrid between the Cuthbert raspberry and the native yellow salmonberry has been produced and named Bensonberry; it is a weak tree fruits. Success with ornamental shrubbery, herbaceous perennials, and annual flowering plants is described. Hyacinths, tulips, and Narcissi are successful both indoors and out. Cabbage, cauliflower, onions, beets, turnips, peas, and celery are the vegetables reported. Of potatoes 45 varieties were grown in addition to 223 varieties originated at the station and known by numbers. Notes on the greenhouse and its management are given.—*J. P. Anderson*.

1874. GROVE, OTTO. Single variety ciders and perries. Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. 1920: 86-90. 1920.—This report concerns the quality of cider or perry made from varieties of apples or pears.—*W. H. Chandler*.

1875. HAMMOND, A. A. **Small fruit culture. The gooseberry.** Jour. Dept. Agric. Victoria 18: 717-732. Fig. 16-30. 1920.—This report also treats of currants.—Wm. E. Lawrence.

1876. HAMMOND, A. A. **Small fruit culture. The raspberry.** Jour. Dept. Agric. Victoria 18: 672-679. Fig. 13-15. 1920.

1877. HEDRICK, U. P. **Cyclopedia of hardy fruits.** viii + 370 p., frontispiece, 16 pl. (colored and halftones), 325 fig. Macmillan Co.: New York, 1922.—This volume is designed as a successor to Downing's Fruits and Fruit Trees, Thomas' American Fruit Culturist, and other like volumes of the past century. It describes 104 species and 1,200 varieties, which list includes the fruits that are now grown in America. The author states that "The chief value of a book like this lies in the accuracy of the descriptions and of the determinations of synonyms. Herein the author has had an advantage over the old pomologists, since his connection with a modern experiment station with a large collection of fruits and a good horticultural library, has given him opportunity to describe first hand and pass impartial judgment on the varieties, and to go to original sources for names; whereas, the old writers, lacking these modern facilities were compelled to copy one from the other."—The ways in which the author designed the manual to be useful are: (1) to aid in the identification of varieties; (2) to guide in the choice of varieties; (3) to sort the names now in the use for varieties of hardy fruits and assign them to the varieties to which they belong; (4) to state in what regions the varieties described grow best; (5) to tell when and where the varieties originated; and (6) by depicting choice products of the orchard, to stimulate the desire to grow better fruits.—The volume was prepared for fruit-growers, nurserymen, students in colleges and high schools, county agricultural agents, and buyers of fruits. For the more elaborate and technical descriptions and historical accounts of varieties the specialist in pomology is referred to the series of fruit books prepared by the same author and published by the New York [Geneva] Agricultural Experiment Station.—J. H. Gourley.

1878. KERKHOVEN, A. R. W. **Lamtoro en kalkbemesting. [Lamtoro and lime fertilizing.]** De Thee 1: 18. 1920.—Lamtoro (*Leucaena glauca*) grows well in limestone outcrops where tea grows poorly, while in non-lime soils, where tea grows well, the lamtoro grows poorly. Various fertilizer tests on lamtoro gave good results whenever lime was included.—Carl Hartley.

1879. LAFFER, H. E. **The pruning of the vine.** New South Wales Dept. Agric. Farmers' Bull. 140. 42 p., 25 fig. 1921.—Eleven principles governing growth and fruit production are cited as a basis for practical pruning. Comparative advantages are discussed with reference to spur and rod pruning and the possibility of developing spurs and rods (under necessity) from water shoots. Methods of framework renewal are described. The following pruning systems are discussed and illustrated: (1) bush or goblet, (2) Thornery spalier, (3) multiple-armed spalier, (4) Bordelais spalier, and (5) Casenave's cordon. Brief notes are given on training the vine in the home garden. [See also Bot. Absts. 9, Entry 1425.]—L. R. Waldron.

1880. LARSEN, J. A. **Some characteristics of seeds of coniferous trees from the Pacific Northwest.** Nation. Nurseryman. 30: 246-249. 2 fig. 1922.—"Germination tests and observations on the characters of seeds of coniferous trees native to Montana and northern Idaho show that the seed is liable to serious injury by storage of the cones in wet condition; that the extraction of the seed under temperatures above 120°F. and in such hot and very humid air reduces the viability of the seed; that sterilization to prevent damping-off or bad molding is apt to injure seed of small, thin seed coats; that the rate of germination of seeds which ordinarily germinate slowly may be hastened materially by reduction of the impervious seed coat; and that coniferous seeds often remain viable in dry storage from eight to ten years."—J. H. Gourley.

1881. NESS, H. Cultivation and care of trees on the farm in Texas. Texas Agric. Exp. Sta. Bull. 293. 76 p. 1922.—Texas soils suitable for orchards are described. Plans for woodlots for shelter and other uses are given, together with the care and kinds of trees for each. Grafting and budding are briefly described and illustrated. Methods of planting and transplanting various trees are explained.—*L. Pace*.

1882. PRESCOTT, E. E. Pomological committee conference at Hobart, April, 1920. Jour. Dept. Agric. Victoria 18: 602-606. 1920.

1883. REINISCH, E. F. A. The weakening effect on a species of plants of being continually reproduced by artificial means. Trans. Kansas Acad. Sci. 30: 62-63. 1919/1921 [1922].—The methods of artificial reproduction, the history of Lombardy poplar and the necessity of, and the directions for, extreme care of its cuttings to prevent decay of the pith are discussed.—*F. C. Gates*.

1884. SAATHOFF. Behelfskulturen für bedrohte Blumen- und Herrschaftsgärtnereien. I. Die Champignon-Kultur. [Mushroom-culture.] Gartenwelt 26: 387-390. 5 fig. 1922.—Mushroom growing is described, as conducted by the firm Marquardt in Zossen. Two types of spawn are available, hard and loose, growers preferring the latter as it is easier to distribute over the beds. The beds are made in spring and summer, of horse manure from stables where the animals are fed on oats and hay. It is heaped and worked over for a period of 8 days and then mixed with dry leaves of linden (*Tilia*), donkey manure, and decayed sod. The mixture is placed in beds 40-50 cm. high and is compacted by tramping. When the soil temperature has gone down to 28°C. the spawn is planted. The mushrooms are grown in semi-darkness in cellars, stables, sheds, mines, catacombs, etc. Harvesting begins after 2-3 months.—*J. C. Th. Uphof*.

1885. SCOTT, L. B. Progress of nursery stock investigations by Department of Agriculture, U. S. A. Nation. Nurseryman 30: 198, 200. 1922.

1886. SIAHAJIA, E. L. Een vergelijking van keprisan en schoonsnoei. [A comparison of skiffing and stick pruning.] De Thee 2: 45-48. 1921.—The 2 methods are compared in detail in 11 respects. The former is cheaper and quicker, it results in earlier production, but must also be repeated sooner, and results in decreased productivity in later years and more damage from *Helopeltis* if the insect is not combatted. Skiffing, however, facilitates 1 method of *Helopeltis* control and yields better grade tea. Various factors control choice of the pruning method. In young vigorous gardens skiffing gives excellent results, while in old gardens it results in 1 excellent flush and practically nothing more. The comparison is for skiffing and stick pruning made at equal height above the ground.—*Carl Hartley*.

1887. SKVORTZOW, B. W. Notes on the agriculture, botany, and zoology of China. Jour. North China Branch Roy. Asiatic Soc. 52: 79-111. 9 fig. 1921.—Chiefly economic data are presented on poppy culture, mountain rice, apricots, plums, fruit culture at Foochow, etc. The paper presents in addition slightly over 7 pages devoted to a bibliography of the botany, zoology, and rural economy of Manchuria, the papers being very largely by Russian authors.—*E. D. Merrill*.

1888. SMITS, J. P. Keprisan en schoonsnoei. [Skiffing (top pruning) vs. stick pruning.] De Thee 1: 72-73. 1920.—Experience on the author's plantation in Java indicates that the skiffing of tea gives better results on poor soils than on good soils. This is attributed to the fact that on the good soils the skiffing results in such heavy production of "Chanji leaves" (resting buds) that it is impossible to maintain clean picking unless exceptionally large forces of pickers are available. This "Chanji leaf" production is therefore not replaced by pecco and in 8 months another pruning is needed.—*Carl Hartley*.

1889. VINSON, A. E., F. J. CRIDER, and G. E. THOMPSON. **The Yuma Mesa.** Arizona Agric. Exp. Sta. Bull. 89. 225-263. 1919.—A commission consisting of an agricultural chemist, a horticulturist, and an agronomist studied the soils, climatology, and crops grown on the Yuma Mesa. The following factors make this region of the greatest promise for citrus culture: efficient shipping facilities, favorable soil and irrigation water, freedom from citrus pests, and the smallest rainfall, lowest relative humidity, and greatest percentage of sunshine of any citrus region in North America. The commission recommends that the Mesa be brought under irrigation and developed by the growing of citrus and other sub-tropical fruits.—*Herbert C. Hanson.*

1890. VON OVEN, F. W. **Selecting superior varieties.** Amer. Bot. 28: 153-154. 1922.—Emphasis is placed upon the desirability of noting superior varieties, as shown by the character of leaves, flowers, or fruits as they occur in the open.—*S. P. Nichols.*

1891. WALLACE, T. **Trial cider orchards.** Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta. 1920: 91-95. 1920.—A report is made of mechanical and chemical analyses of the soils of some of the trial cider orchards.—*W. H. Chandler.*

1892. WHITTLE, C. A. **The pineapple pear.** Florida Grower 28¹³: 5. 1922.—This pear variety is resistant to blight and is valued more than Kiefer by canners. The yield is exceedingly heavy. Only a few orchards in the South are planted to this variety.—*J. C. Th. Uphof.*

1893. WICHMANN, H. J. **Report on determination of pectin in fruit and fruit products.** Jour. Assoc. Official Agric. Chem. 6: 34-40. 1922.—The present tentative official method of determining pectin by alcohol precipitation is unreliable and a new method is submitted.—*F. M. Schertz.*

1894. WILDEMAN, E. DE. **Quelques considérations sur les bananiers.** [Notes on bananas.] Rev. Bot. Appl. 1: 241-269. 1921.—The writer has sought for several years to arouse interest in this group of plants, especially those varieties found wild and cultivated in central Africa. He believes that certain species of *Musa* are indigenous to central Africa, though this region need not be considered as the original source of all bananas. A number of recent papers and books on the banana are discussed, including the well known book by Fawcett, published in 1913; O. W. Barrett's paper in Philippine Agric. Rev. July, 1912; Robertson Proschowsky's paper in Petite Rev. Agric. et Hort. July 8, 1917; and the article by W. J. Allen and R. G. Bartlett in Agric. Gaz. New South Wales [see Bot. Absts. 7, Entry 947]. These publications only go to show the necessity of a profound study of the entire question in all of its aspects; this study should include consideration of the distribution of the species and varieties, detailed examination of each species and variety, with the particular uses and cultural requirements of each. The banana wilt and other diseases and also insect pests should be thoroughly investigated. The species of *Musa* discussed include *M. sapientum*, *M. paradisiaca*, *M. Cavendishii*, *M. textilis*, *M. religiosa*, *M. arnoldiana*, *M. ensete*, *M. superba*, *M. rosacea*, and *M. Gilletii*. Two analyses of the common banana are given to show the food value, and the banana as a source of alcohol is briefly considered.—*Paul Russell.*

FLORICULTURE AND ORNAMENTAL HORTICULTURE

1895. ANONYMOUS. **Display of perennial asters.** Brooklyn Bot. Gard. Rec. 11: 121-122. 1922.—The 1st season's results with varieties of *Aster novae-angliae*, *A. novi-belgii*, and *A. Amellus* grown in 1922 at Brooklyn Botanic Garden are recounted. The plants were obtained from Aldenham House gardens, near London.—*C. S. Gager.*

1896. ANONYMOUS. **Old garden flowers. III.** Amer. Bot. 28: 95-97. 1922.—*Monarda* is considered.—*S. P. Nichols.*

1897. ANONYMOUS. *The Dahlia*. Gard. Chron. 72: 164. 1922.—Notes are given on the recent exhibition of the National Dahlia Society and a brief discussion of the introduction of the Dahlia into England.—*P. L. Ricker*.

1898. ANONYMOUS. [Rev. of: TRELEASE, WM. *Plant materials of decorative gardening: The woody plants*. 2d ed. rev., xlii + 177 p. The Author: Urbana, Illinois, 1921.] *Nature* 110: 177. 1922.

1899. BIRD, HENRY. *Gardening in an artificial bog*. Amer. Bot. 28: 97-102. 1922.—Directions for making and planting an artificial bog are given.—*S. P. Nichols*.

1900. BROTHERSTON, R. P. *Calceolaria*. Gard. Chron. 72: 52. 1922.—Annual species were introduced into cultivation a century ago, but the first shrubby species as early as 1777. The history of their cultivation and some of the literature are reviewed.—*P. L. Ricker*.

1901. DRESSEL, JOH. *Treiben von Zwerg Iris—Iris pumila*. [Forcing of the dwarf Iris.] Möllers Deutsch. Gärtnerzeitg. 37: 206. 1922.—At the beginning of winter the rhizomes of *Iris pumila* are placed in boxes 12-15 cm. high; if planted too deep they rot. These boxes are set in frames free from frost and early in February they are placed in a hothouse, close under the glass. They flower March-May.—*J. C. Th. Uphof*.

1902. DYKES, W. R. *Iris conference*. Gard. Chron. 71: 325-326. 1922.—Held at Vincent Square, London, June 7 and 8, the conference brought together the best collectors of garden varieties of bearded Irises ever shown in the Hall. Extended notes on exhibits and exhibitors are given.—*P. L. Ricker*.

1903. GRIMM, KARL. *Mehr Cyclamen-Blumen zum Pflücken im Winter*. [More cyclamen flowers in winter.] Möllers Deutsch. Gärtnerzeitg. 37: 205-206. 2 fig. 1922.—The author emphasizes the fact that cyclamen should be grown in winter for the cut-flower industry. The newer varieties especially develop colors valuable for bouquets. Only the finest and largest flowers should be grown.—*J. C. Th. Uphof*.

1904. JACOB, JOSEPH. *Select bulbs for 1922*. Gard. Chron. 72: 150. 1922.—Notes are given on tests of recent varieties.—*P. L. Ricker*.

1905. JUNGE, HEINRICH. *Aster ericoides* "Schneetanne" und *Aster vimineus* "Erlkönig." Möllers Deutsch. Gärtnerzeitg. 37: 209. 1 fig. 1922.—The small flowering herbaceous *Aster ericoides* Schneetanne and *A. vimineus* are recommended as the best of this type. They flower from September until the middle of October.—*J. C. Th. Uphof*.

1906. O'B., J. *Yellow Dendrobiums*. Gard. Chron. 72: 125. Fig. 52. 1922.—Distribution of yellow species in nature, their hybridization, and the varieties are discussed.—*P. L. Ricker*.

1907. PROSCHOWSKY, A. ROBERTSON. *Palms of the Riviera*. Gard. Chron. 71: 317. 1922.—The genus *Livistona* is well known to gardeners, but not sufficiently planted on the Riviera. *L. chinensis* was until recently the most cultivated palm in the market, but now is being replaced by *Howea forsteriana*. The former are more graceful fan palms with more beautifully shaped leaves than those covered in previous article. Some are of remarkable size, ranging up to 8-10 m. in height, but are very slow growing.—*P. L. Ricker*.

1908. PROSCHOWSKY, A. ROBERTSON. *Palms of the Riviera*. Gard. Chron. 72: 66. Fig. 28. 1922.—*Livistona australis* is figured and compared with related palms on the Riviera.—*P. L. Ricker*.

1909. TREVITHICK, W. E. **Metamorphosis of *Rhododendron* inflorescence.** Gard. Chron. 72: 123. Fig. 50. 1922.—A form resembling some double forms of *Camellia* found at Kew on *R. corona* is figured and described.—P. L. Ricker.

VEGETABLE CULTURE

1910. BEATTIE, W. R. **Peat soils in vegetable production.** Jour. Amer. Peat Soc. 154: 28-32. 1922.—These soils are valuable for the production of lettuce, celery, and onions, and the possibilities with other crops have scarcely been touched upon.—G. B. Rigg.

1911. GLEISBERG, W. **Gemüsesorten und Pflanzenzüchtung.** [Vegetable varieties and plant breeding.] Gartenwelt 26: 370-372. 1922.—Varieties of vegetables should be examined as to their purity, for a great number of commercial varieties belong to "a population" instead of to a pure line. In 17 seed catalogues there were too many varieties of the same type. Of white cabbage there were 26 varieties which are early and round, 10, early and pointed 25, late and round, and 6, late and pointed.—J. C. Th. Uphof.

1912. SCHMIDT, J. C. **Buschbohne Wachs Schlossperle.** [Dwarf bean "Wachs Schlossperle."] Möllers Deutsch. Gärtnerzeitg. 37: 213. 2 fig. 1922.—This is an account of a white bean, produced from a colored variety. It has a fine flavour, is very productive, and is 10-12 days earlier than Wachs (wax) Flageolet.—J. C. Th. Uphof.

HORTICULTURE PRODUCTS

1913. ALLEN, W. J., and J. M. ARTHUR. **Some experiments in drying apricots.** Agric. Gaz. New South Wales 33: 738. 1922.—The methods used are described and tabulated.—L. R. Waldron.

1914. CHACE, E. M. **By-products from citrus fruits.** U. S. Dept. Agric. Dept. Circ. 232. 13 p. 1922.

1915. DEUSS, J. J. B. **Eenvoudige oven om kleine hoeveelheden thee af te drogen.** [Simple oven for drying small quantities of tea.] De Thee 1: 79-80. 1 fig. 1920.—An oven successfully used on a small plantation in Java is described and diagrammed.—Carl Hartley.

1916. DEUSS, J. J. B. **Over coffeine bereiding uit theeblad en thee.** [Concerning the preparation of caffeine from tea leaf and tea.] De Thee 2: 62-63. 1921.—The 1st and 2nd leaves contain 4.3 per cent, and the 5th and 6th, 1.5 per cent, of caffeine. Tea prunings yielded 2.3 per cent, and the "fluff" from the leaves 2.25 per cent.—Carl Hartley.

1917. DEUSS, J. J. B. **Resultaten van de enquête over het drogen. I.** [Results of the questionnaire on drying. I.] De Thee 1: 112-117. 1920.—Data are given on the performance of various makes of tea-drying machines obtained by a questionnaire addressed to Java tea growers.—Carl Hartley.

1918. DEUSS, J. J. B. **Resultaten van de enquête over het drogen. II.** [Results of investigation of drying. II.] De Thee 2: 16-19. 1921.—A comparison of 2 drying installations for tea is made.—Carl Hartley.

1919. DEUSS, J. J. B. **Verpakking van thee in vetpapier in plaats van lood.** [Packing tea in oiled paper instead of lead.] De Thee 1: 119-120. 1920.—Oiled paper is used for small packages of tea in Holland, but cannot be employed in the moist atmosphere of West Java, even in retail trade, the tea so packed becoming thoroughly moulded in 2 months. Packing in paraffin paper and so-called parchment paper also failed. For some reason, even tea kept in glass-stoppered jars or sealed glass tubes moulds more quickly than tea kept in lead containers which have been closed merely by folding. Perhaps too tight closure is undesirable.—Carl Hartley.

1920. HEIDE, VON DER. Neuere Erfahrungen auf dem Gebiete der Weinbehandlung insbesondere der Obstweine. [New experiences in handling wine, especially fruit wine.] Mitteil. Deutsch. Landw. Ges. 37: 687-692. 1922.—In this address the author spoke at length on some of the factors influencing wine making. The following subjects were discussed: pure yeasts; acidity changes; artificial decrease and increase in acidity; the absorption of acid from burning sulphur; filtering and purifying; the addition of water and sugar.—A. J. Pieters.

1921. HILTS, R. W. Report on the determination of moisture in dried fruits. Jour. Assoc. Official Agric. Chem. 6: 40-48. 1922.—Results of moisture determinations on peaches, pears, and apricots, using vacuum and water-oven methods, are reported.—F. M. Schertz.

1922. KNAUTH, ANDREAS. Obstsorten für die Dauerwarenherstellung. [Fruit varieties for preserving.] Gartenwelt 26: 369-370. 1922.—This is a general account from Germany of various varieties of fruits suitable for preserves, cider, etc.—J. C. Th. Uphof.

MORPHOLOGY, ANATOMY AND HISTOLOGY OF VASCULAR PLANTS

E. W. SINNOTT, *Editor*

(See in this issue Entries 1824, 1838, 1909, 2016, 2048, 2056, 2066, 2085, 2218)

MORPHOLOGY AND TAXONOMY OF ALGAE

E. N. TRANSEAU, *Editor*

L. H. TIFFANY, *Assistant Editor*

(See also in this issue Entries 1947, 2066)

1923. BATTEN, L. Organs of attachment in Polysiphonia. [Abstract.] Rept. Brit. Assoc. Adv. Sci. 1921: 452. 1921.

1924. BRUCK, ERWIN. Experimentelle Untersuchungen an den Schwärmern von Chromulina Rosanoffii (Bütschli). [Experimental studies of the swarm spores of Chromulina Rosanoffii.] 8 vo, 49 p. Diss. Breslau, 1921.

1925. DVOŘÁK, R. Sur la recherche des algues en Moravie. [On the study of algae in Moravia.] Nuova Notarisia 33: 135-138. 1922.—A brief review is presented of the results of studies of the algae of Moravia and Bohemia, especially by Nave, Richter, Dvořák, Prát, and Fischer, and with dates of publication ranging from 1863 to 1920.—Marshall A. Howe.

1926. FUNK, GEORG. Über einige Ceramiaceen aus dem golf von Neapel. [Some Ceramiaceae from the Gulf of Naples.] Beih. Bot. Centralbl. II Abt. 39: 223-247. Pl. 5. 1922.—Habitats and associated plants are given and a summary of the Ceramiaceae found in the Gulf of Naples is added. *Vickersia canariensis* Karsakoff var. *mediterranea* is described as new. *Dohrniella* is proposed as a new genus, with *D. neapolitana* a new species. *Ceramium Bertholdi* and *Callithamnion Aegagropilae* are new species.—L. Pace.

1927. HUFF, N. L. Copper sulphate for preventing algal growths in lakes and reservoirs. Engineering and Contracting 58: 33-36. 1922.—The copper sulphate method of control or destruction of algal growths is described under the method of application, the amount required, and the effect of the chemical on fish life.—H. H. Wagenhals.

1928. MAMELI, EVA. Sulla costituzione chimica della membrana delle alghe Cianoficee. [On the chemical constitution of the membrane of the Cyanophyceae.] Atti Ist. Bot. Univ. Pavia 17: 257-264. 1920.—The chemical constitution of the membrane of the Cyanophyceae has been known for only a small number of genera and with some lack of uniformity in results; there has been in particular some uncertainty as to whether cellulose is present in all. The

present research is based upon 34 genera, represented by about 100 species, including a few lichen-forming species, which give the following conclusions: (1) cellulose is present in general in the membranes of all the Cyanophyceae, a result that harmonizes the chemical behavior of the dermatoplasm of these algae with that of the vegetal cell in general; (2) the cellulose is usually accompanied by a pectic substance; (3) the search for chitin gave negative results; (4) the products of hydrolysis of the cellulose of the Cyanophyceae thus far met with are pentosans and galactans. The membrane of the Cyanophyceae is then, in general, of a pectic-cellulose nature.—*Marshall A. Howe.*

1929. MAZZA, ANGELO. Aggiunte al saggio di algologia oceanica. [Appendix to the essay on oceanic algology.] *Nuova Notarisia* 33: 1-31, 97-125. 1922.—The author continues his systematic and morphological studies of the Florideae of the world. The species particularly described and discussed are *Leptocladia Binghamiae*, *L. conferta*, *Nitophyllum Cardianum*, *N. Durvillei*, *Botryoglossum violaceum*, *B. Ruprechtianum*, *Phytomorpha imbricata*, *Schizoneura Davisii*, *Ptilonia magellanica*, *Bonnemaisonia hamifera*, *Ricardia Montagnei*, *Laurencia perforata*, *L. spectabilis*, *Coeloclonium opuntoides*, *Chondria foliifera*, *C. debilis*, and *C. crassicaulis*.—*Marshall A. Howe.*

1930. SETCHELL, WILLIAM ALBERT, and NATHANIEL LYON GARDNER. Phycological contributions. II to VI. *Univ. California Publ. Bot.* 7: 333-426. *Pl.* 32-49. 1922.—The "contributions" and their contents of novelties are as follows:—II. New species and new forms of *Myrionema*: *M. primum*; *M. primum* f. *acuminatum*; *M. minutissimum*; *M. foecundum* f. *simplicissimum*, *subulatum*, *ramulosum*, *divergens*, and *majus*; *M. coronae* f. *uniforme*, *angulatum* and *sterile*; *M. balticum* f. *pedicellatum* and *californicum*; *M. globosum* f. *affine*; *M. compsonematoides*; *M. hecatonematoides*; *M. attenuatum*; *M. attenuatum* f. *doliiforme*; *M. phyllophilum*; *M. setiferum*; *M. obscurum*.—III. New species and new forms in *Compsonema*: *C. streblonematoides*, *C. intricatum*, *C. fructuosum*, *C. pusillum*, *C. speciosum* f. *piliferum*, *C. sporangiiferum*, *C. sessile*, *C. tenue*, *C. nummuloides*, *C. fasciculatum*, *C. myrionematoides*, *C. secundum*, *C. ramulosum*, *C. serpens*, *C. coniferum*, *C. dubium*, *C. secundum* f. *terminale*.—IV. New species of *Hecatonema*: *H. variabile*, *H. clavatum*, *H. Lawsonii*.—V. New species of *Pylaiella* and *Streblonema*: *Pylaiella tenella*, *P. unilateralis*, *Streblonema Porphyræ*, *S. myrionematoides*, *S. penetrans*, *S. vorax*, *S. scabiosum*, *S. evagatum*, *S. rugosum*, *S. transfixum*, *S. corymbiferum*, *S. anomalum*, *S. Johnstonæ*. *S. acidoides* f. *pacificum* appears as a new form, and *S. investiens* (Collins) as a new combination.—VI. New species of *Ectocarpus*: *E. affinis*, *E. chantrantoides*, *E. commensalis*, *E. eramosus*, *E. flagelliferus*, *E. flocculiformis*, *E. fructuosus*, *E. granuloides*, *E. Mesogloia*, *E. Saundersii*, *E. simulans*, *E. socialis*, *E. Taoniae*. Further are to be noted: *Ectocarpales* nom. nov.; *Ectocarpus acutus* nom. nov.; *E. confervoides* f. *parvus* (Saunders) comb. nov.; *E. cylindricus* f. *typicus* nom. nov.; *E. cylindricus* f. *codiophilus* f. nov.; *E. cylindricus* f. *acmaeophilus* f. nov.; *E. siliculosus* f. *subulatus* (Kuetz.) comb. nov.—*W. A. Setchell.*

1931. SHAW, W. R. *Copelandosphaera*, a new genus of the Volvocaceae. *Philippine Jour. Sci.* 21: 207-232. *Pl.* 1-4. 1922.—A new species is made the type of a new genus under the name *Copelandosphaera dissipatrix*. It differs from *Volvox* and *Janetosphaera* in having no protoplasmic connections between the cells, and also in having the gonidia differentiated from the somatogenic cells before the last cell divisions in the growth of the coenobium. It differs from *Campbellosphaera* and *Merrillosphaera* in having the gonidia differentiated late in the embryonic development. It is unlike *Campbellosphaera* in not having its gonidia marginal and migratory, and is unlike *Merrillosphaera* in not having regular numbers of gonidia with geometrically symmetrical arrangement. Bisexual individuals produce many oogonidia and a few androgonidia that are of about the same size. An American species (*V. spermatosphaera*) is included in this new genus.—*E. D. Merrill.*

1932. SKOTTSBERG, CARL. Notes on Pacific Coast algae, II. On the Californian "*Deleseria quercifolia*." *Univ. California Publ. Bot.* 7: 427-436. *Pl.* 50. 1922.—The author

shows that the red alga of the Pacific Coast of North America which has generally passed under the name of *Delesseria quercifolia* Bory is not of that species. He names it *Phycodrys Setchellii* sp. nov.—W. A. Setchell.

1933. SKVORTZOW, B. W. Notes on the agriculture, botany, and zoology of China. Jour. Roy. Asiatic Soc. North China Branch 53: 189-195. 1922.—The author includes a list of 21 fresh-water algae from Fukien; no new names appear.—E. D. Merrill.

1934. STRØM, K. MÜNSTER. Some algae from Merano. Nuova Notarisia 33: 126-134. Fig. 1-2. 1922.—An annotated list is given of 43 species of freshwater algae, collected in the autumn of 1921 in the vicinity of Merano, in what is now the Italian Tirol, mostly at an elevation of 5,500-5,720 feet. *Cosmarium Majae* sp. nov. is described and figured.—Marshall A. Howe.

1935. TEREK, ELINOR. Einige neue Grünalgen. [Some new green algae.] Beih. Bot. Centralbl. II Abt. 39: 179-195. Pl. 1-2. 1922.—The cultural methods used are given. The following species are described as new: *Stenoplana Bertholdi*, *Bracteacoccus aggregatus*, *Chlorococcum intumescens*, *Tetracoccus cartilagineus*, *Chlorosarcina cumuliformis*.—L. Pace.

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

ALEXANDER W. EVANS, *Editor*

(See also in this issue Entries 1972, 2066)

1936. AMANN, J. Le *Bryum Schleicheri* Schwaegr. Rev. Bryologique 49: 25-28. 1922.—According to the descriptions of Limpricht and Roth, *Bryum Schleicheri* Schwaegr. is distinguished from the closely related *B. turbinatum* (Hedw.) Schwaegr. by its long-decurrent leaves. The author shows that this difference was based on a misconception and that the leaves in both species are slightly or not at all decurrent. He separates the species by means of other anatomical differences in the leaves and calls attention to 2 exotic relatives of *B. Schleicheri*—one from Chile and the other from India.—A. W. Evans.

1937. DOUIN, R. Le sporophyte des Marchantiées. [The sporophyte of the Marchantieae.] Rev. Gén. Bot. 34: 321-335. Pl. 12-13, 4 fig. 1922.—It is shown that the sporophytes of the Marchantieae are fully as diverse as those of the Jungermanniales. Throughout the group a differentiation into foot, seta, and capsule is everywhere apparent, and the author first discusses these parts in detail, laying especial emphasis on the structure of the capsule-wall and the various methods of dehiscence. He then describes the parts that protect the sporophyte during its development and points out their importance from the standpoint of classification. These parts include the calyptra, the involucre, and the perianth, the last being present in only 4 genera.—J. C. Gilman.

1938. HUSNOT, T. Hepaticologia Gallica. Flore analytique et descriptive des Hépatiques de France et des contrées voisines. [Gallic hepaticology. Analytic and descriptive flora of the Hepaticae of France and neighboring countries.] 2nd ed., 163 p., 23 pl., Cahan par Athis (Orne), France, 1920.—The 1st edition of this manual on French Hepaticae was published in 1881 and included 45 genera and 174 species; the 2nd edition, which is essentially a new work, includes 80 genera and 289 species. In a short introduction the general morphology of the Hepaticae is described, and directions are given for collecting and studying specimens. The work then proceeds to the description of the species, genera, and larger groups represented, artificial keys being provided wherever necessary. The Hepaticae are first divided into the 3 grand divisions Jongermanniaceées, Marchantiaceées, and Anthocérotoceées; and the Jongermanniaceées are subdivided into the Acrogynes and the Anaerogynes. The Acrogynes are then subdivided into the following tribes: Jubulées (5 genera and 23 species), Madothecées (1 genus and 6 species), Pleuroziées (1 genus and 1 species), Radulées (1 genus and 6 species), Scapaniées (2 genera and 24 species), Blepharozziées (7 genera and 9 species), Cephalozziées

(11 genera and 52 species), and Lophoziacées (23 genera and 101 species). The Anacrogynes yield the tribes Haplomitriées (1 genus and 1 species), Fossombroniées (4 genera and 11 species), Dilénées (2 genera and 4 species), Metzgeriées (2 genera and 10 species), Riellées (1 genus and 2 species) and Sphérocarpées (1 genus and 2 species); while the Marchantiacées are directly divided into the tribes Marchantiées (13 genera and 19 species), Targioniées (1 genus and 1 species), Corsiniées (1 genus and 1 species), and Ricciées (2 genera and 10 species). The Anthocerotacées, which are not subdivided into tribes, include 2 genera and 6 species. As a rule the species are understood in a broad sense, so that some of the so-called "small" species described during recent years are either totally ignored or reduced to varietal rank. Under each species data are given regarding the local distribution within the region studied and also the general distribution, in the case of species extending beyond this region. The plates comprise about 1,800 separate figures. These represent the species described in natural size and also with enlarged details.—A. W. Evans.

1939. H[USNOT], T. [REV. OF: DAVY DE VIRVILLE, AD., et ROBERT DOUIN. Sur les modifications de la forme et de la structure des hépatiques maintenues submergées dans l'eau. (Concerning the modifications of form and structure of hepatics brought about by maintaining them under water.) Compt. Rend. Acad. Sci. Paris 172: 1306-1308. 1921 (see Bot. Absts. 10, Entry 603).] Rev. Bryologique 49: 32. 1922.—The reviewer (in a footnote) calls attention to the various forms assumed by *Hypnum cupressiforme* under different environmental conditions and intimates that such forms, in the case of a less common moss, would be treated as distinct species, to the detriment of science.—A. W. Evans.

1940. LOESKE, L. Adventive Moose bei Berlin. [Adventive mosses in the vicinity of Berlin.] Bryol. Zeitschr. 1: 138, 140. 1918.—Attention is called to a series of mosses apparently introduced into the Berlin flora. Some of these were found on boulders in the Botanical Garden at Dahlem and the others on oak logs from Bohemia piled up at Strausberg. Of the species listed from Dahlem the following are otherwise unknown in the district under consideration: *Anomodon attenuatus*, *Barbula reflexa*, *Brachythecium laetum*, and *Grimmia Hartmanni*. Of the Strausberg species *Antitrichia curtipendula* and *Leskea nervosa* are the most interesting, the *Leskea* being new to the region.—A. W. Evans.

1941. L[OESKE], L. Zur Bryogeographie Mitteleuropas. [On the bryogeography of Central Europe.] Bryol. Zeitschr. 1: 142-144. 1918.—The author gives notes on the distribution of 14 mosses in Central Europe. Among the more interesting of these are the following: *Barbula flavipes*, new to Thuringia; *Catoscopium nigratum*, new to East Prussia; *Dichelyma capillareum*, new to western Europe; *Mnium cinclidioides*, new to the March of Brandenburg; *Orthothecium intricatum*, new to the Harz Mountains; and *Plagiobryum Zierii*, new to the Black Forest.—A. W. Evans.

1942. MAHEU, JACQUES. Sur une tardive régénération de mousse. [On a delayed regeneration in a moss.] Compt. Rend. Acad. Sci. Paris 174: 1124-1126. 10 fig. 1922.—The author describes the regeneration of *Barbula muralis* Hedw. in material that had been kept dry for 14 years. When placed in a humid atmosphere some of the leaf cells gave rise to short filaments each of which bore a rounded unicellular gemma at the tip. Upon becoming detached this developed into a typical moss protonema upon which a lateral bulblet was produced, this bulblet growing directly into a diminutive leafy shoot. The various steps in the process are figured.—C. H. Farr.

1943. MOENKEMEYER, W. Ueber *Hypnum turgescens* und *trifarum*. [On *Hypnum turgescens* and *H. trifarium*.] Bryol. Zeitschr. 1: 140, 141. 1918.—The author expresses the opinion that *Hypnum turgescens* T. Jens. is not closely related to *H. trifarium* and *H. stramineum*, as certain authors have stated or implied. He thinks that these 2 species are clearly referable to the genus *Calliergon*, while *H. turgescens* is so closely related to *H. scorpioides* L., a member of the genus *Scorpidium*, that he reduces it to varietal rank, giving it the name *Scorpidium scorpioides* var. *turgescens* (T. Jens.) Moenkemeyer. In connection with *Calliergon stramineum* he describes a new var. *patens*, basing it on various European specimens.—A. W. Evans.

1944. PAUL, H. Ueber *Hypnum turgescens* T. Jensen, eine systematisch-geographische Studie. [On *Hypnum turgescens*, a systematic-geographic study.] Bryol. Zeitschr. 1: 145-160. 8 fig. 1918.—In this paper, which is not yet completed, the author discusses the relationships of *H. turgescens* to other hypnoid mosses and gives an account of its geographical distribution and vegetative reproduction. After summarizing the involved synonymy of the species he reaches the conclusion that it is distinct from *H. scorpioides* L., to which Moenkemeyer had reduced it as a variety [see previous entry]. He refers both species to the genus *Scorpidium* of which he gives a revised description, laying especial emphasis on the variability of the leaf-nerves, on the poorly defined alar cells, on the concavity of the leaves, and on the absence of rhizoid-initials among the leaf-cells. As thus amended the genus includes the following 4 species, 2 of which represent new combinations: *S. lycopodioides* (Brid.), *S. scorpioides* (L.) Limpr., *S. turgescens* (T. Jens.) Loeske, and *S. trifarium* (Web. & Mohr.). In addition to these the following new combinations, based on northern species, are tentatively proposed: *S. brevifolium* (Lindb.), *S. latifolium* (Lindb.), and *S. longicuspis* (Lindb. & Arnell). From the genus *Scorpidium* the author excludes the northern *H. badium* Hartm. in spite of its forked leaf-nerves, making it the type of the new genus *Loeskypnum* and giving it the name *L. badium* (Hartm.). The European distribution of *Scorpidium turgescens* includes 2 distinct areas, an arctic area extending as far south as Esthonia and Livonia and an alpine area in the mountains of Central Europe. The organs of vegetative reproduction are deciduous apical buds; these break away and renew their growth directly or else give rise to lateral shoots.—A. W. Evans.

1945. PÉTERFI, MARTIN. O formă teratologică la *Catharinaea Haussknechtii* (Jur. et Milde) Broth. [A teratological form of *Catharinaea Haussknechtii*.] Bull. Soc. Stiințe Cluj 1: 149-153. 1 fig. 1921.—A teratological form of *Catharinaea Haussknechtii* is described in which the wall of the archegonium, after fertilization, does not show the usual differentiation into vaginule and calyptra but forms merely an elongated tube enclosing the lower half of the seta. At the upper end vestiges of the neck are often to be seen, showing that the tube has actually arisen from the whole of the ventral wall. In this case the archegonium of a moss resembles that of a liverwort in its later development. In connection with the abnormality just described other teratological features make their appearance, the various organs of the sporogonium (for example) failing to attain their usual size. The author designates the abnormality in the archegonium as "archegonio-solenoidie" and states that no similar case has been described in the literature. In his opinion it yields an additional point of evidence that the Hepaticae form an older group than the Musci.—M. Tiesenhausen.

1946. POTIER DE LA VARDE, R. Récoltes bryologiques en Asie Orientale. [Bryological collections in eastern Asia.] Rev. Bryologique 49: 28-31. 1 pl. 1922.—The author gives a list of 11 species of mosses collected in 1914 by V. Demange in Tonkin and China, a definite station being given for each species. *Campylopus Demangei* Thér. et P. de la V. from Tonkin and *Entodon punctulatus* Thér. et P. de la V. from China are proposed as new and illustrated, while *Timmiella multiflora* C. M. is reduced to synonymy under *T. rosulata* C. M. The original description of *Pseudo-Leskea Larminati* Broth. et Par., a rare species of Tonkin, is corrected and supplemented by an account of the capsule.—A. W. Evans.

1947. QUELLE, FERDINAND. Die Organismen-Spezies als Kurve, an den Moosen dargestellt. [The organism-species as a curve, illustrated by the mosses.] Bryol. Zeitschr. 1: 115-137. 27 fig. 1918.—The author brings out the fact that the genus-concept in the organic world is something more or less artificial and that the boundaries of a genus are based on arbitrary distinctions. He emphasizes his point by quotations from Limpricht, in which the vague and uncertain differences between many moss genera are brought out. In order to illustrate the relationships of a species to other species he attempts to represent it graphically by a curve, based on definite characters not subject to a personal equation in their interpretation. He demonstrates his method by means of 25 species of hepatics and mosses and 83 bryophytic characters arranged in a definite series. The first 5 characters, which will

give an idea of the others, are the following: (1) the egg to be fertilized arises in an archeogonium on the moss plant and develops into the sporogonium after fertilization; (2) the green pigment is in chlorophyll-plates with pyrenoids; (3) the green pigment is in chlorophyll grains; (4) special cells with oil-bodies are present; (5) all the green cells contain oil-bodies. Taking the characters of the various species into consideration and using a peculiar method of plotting the author is able to construct a distinctive curve for each species, and these curves are represented by the text figures. In an appendix to the paper theoretical discussions are given on alternation of generations in the mosses and on the significance of the peristome.—A. W. Evans.

1948. THÉRIOT, I. *Le problème du Leucobryum candidum*. [The problem of *Leucobryum candidum*.] Bull. Soc. Bot. Genève 13: 217-225. 3 fig. 1921.—According to Paris and Jaeger *Leucobryum brachyphyllum* (Hornsch.) Hpe. is a synonym of *L. candidum* (Brid.) Jaeger, the latter species being based on *Dicranum candidum* Brid. The author first presents evidence to show that *D. candidum* Brid. is antedated by a few months by *D. candidum* Schwaegr., although both date from 1826, and concludes that the species should therefore be called *Leucobryum candidum* (Schwaegr.) Jaeger. He then shows that *L. brachyphyllum* is amply distinct from *L. candidum* and brings out the differential characters separating the 2 species by means of figures and revised descriptions. At the conclusion of his paper he figures and proposes as new another ally of *L. candidum* under the name *L. confusum*. *L. brachyphyllum* and *L. candidum* are apparently confined to Australia and Tasmania, while *L. confusum* is known from Tasmania, New Zealand and New Caledonia.—A. W. Evans.

1949. THÉRIOT, I. *A propos du Leucobryum candidum*. [Regarding *Leucobryum candidum*.] Rev. Bryologique 49: 31, 32. 1922.—The author corrects a statement made in an earlier paper on *Leucobryum candidum* (see preceding entry). He now shows that the name *Dicranum candidum* Brid. dates from 1798, instead of from 1826, and that the citation *L. candidum* (Brid.) Jaeger is therefore correct.—A. W. Evans.

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. FITZPATRICK, *Editor*

D. S. WELCH, *Assistant Editor*

(See also in this issue Entries 1641, 1649, 1668, 1884, 2021, 2023, 2025-2032, 2035, 2037-2042 2073, 2106, 2107, 2120, 2123, 2128, 2129, 2142)

FUNGI

1950. ANONYMOUS. *Pathological herbarium notes* 5. 7 p. U. S. Dept. Agric. Bur. Plant Indust. Office Path. Collections: Washington, D. C. 1922.—Accessions for period, April 1-November 1, 1922, include 2,386 specimens. Lists of exsiccati and special collections received are listed, and noteworthy species represented in recent accessions are named.—H. M. Fitzpatrick.

1951. ANDERSON, J. P. *Some Alaska fungi*. Proc. Iowa Acad. Sci. 27: 99-108. 1920.—A list is given of 133 species of parasitic and saprophytic fungi, from *Plasmodiophora* and the bacteria to Fungi Imperfecti. Determinations were made mostly by the U. S. Department of Agriculture at Washington. Host plants (137) are listed alphabetically; the fungi are systematically arranged, with notes on frequency and habitat.—H. S. Conard.

1952. BARTHOLOMEW, ELAM. *Edible mushrooms of Kansas*. Trans. Kansas Acad. Sci. 30: 174-179. 1919/21 [1922].—A popular account is presented of a few species in Kansas, with a plea for greater utilization.—F. C. Gates.

1953. BONAR, LEE. *The life history of Rosellinia Caryae sp. nov. causing a hickory canker and disease*. Phytopathology 12: 381-385. Fig. 1-3. 1922.—A canker of the twigs and

trunks of young trees of *Carya ovata* (Mill.) Koch. not previously reported has been observed near Ann Arbor, Michigan. The cankers are dead sunken areas, varying from small spots less than 1 inch long to areas 3 inches broad and 6 inches long. On twigs the cankers are usually formed about the leaf scar, but sometimes involve the entire twig. In a few cases young trees, 2-3 inches thick, were killed to the ground. On young twigs the cankers invariably showed numerous fungous pycnidia breaking through the dead bark. Some of the cankered twigs, after being washed in mercuric chloride solution, were placed in test tubes containing a little sterile water. After 6 months perithecia with mature ascospores were quite abundant. Cultures from the ascospores and from the pycnosporos produced pycnidia of the same type.—*B. B. Higgins.*

1954. BOSE, S. R. One new species of Polyporaceae and some polypores new to Bengal. *Ann. Mycol.* 19: 129-131. *Pl.* 1-3. 1921.—*Fomes rufalaccatus* is described as new from Junjub, India. *Polyporus inzonensis* Murrill, *Fomes durissimus* Lloyd, and *Trametes fuscella* Lévillé are reported from Calcutta and Bengal.—*H. S. Jackson.*

1955. BUCHNER, P. Zur Kenntniss der Symbiose niederer pflanzlicher Organismen mit Pediculiden. [Symbiotic relations between lower plant organisms and the Pediculidae.] *Biol. Centralbl.* 39: 535-540. 1919.—The author presents results of investigations conducted contemporaneously with, but independent of, Sikora [see Bot. Absts. 12, Entry 1983] in which he shows that the abdominal organ (Magenscheibe) of certain Pediculidae is a mycelium-harboring body homologous with the mycetocyte of Coccids and with similarly functioning structures in other insects [Blattidae, Hymenoptera (*Camponotus*, *Formica*), and certain Coleoptera]. In all these cases a symbiotic relation exists between the insect and fungus mycelium. The author cites Sikora's priority in the announcement of the true nature of these organs (in head lice and others, the Magenscheibe), but has carried researches further in showing manner in which the eggs of the insect become infected with the fungus. A fuller presentation of results is promised.—*William L. Bray.*

1956. DIETEL, P. Kleine Beiträge zur Systematik der Uredineen. [Minor contributions to the taxonomy of Uredinales.] *Ann. Mycol.* 20: 29-33. 1922.—The author calls attention to the catenulate urediniospores of *Melampsora Hypericorum* (DC.) Wint. and the absence of associated pycnia. The species is thought to be heteroecious and is considered to represent an intermediate form between *Coleosporium* and *Melampsora*. *Mesospora* is proposed as a new genus with this species as the type.—*Tranzschelia* Arth. is accepted as a valid genus on morphological grounds, but the author takes exception to *Lipospora* Arth. and *Polythelis* Arth., -opsis and micro-forms of similar type, on the ground that to accept genera on a life history basis results in placing in different genera species which are obviously closely related. *Tranzschelia Pruni-spinosae* (Pers.) is proposed as a new combination to replace *T. punctatum* (Pers.) Arth. *Lipospora tucsonensis*, *Polythelis fusca*, *P. Pulsatillae* and *P. Thalictri* are transferred to *Tranzschelia*.—The relationship of *Ochropsora* is discussed. Biological evidence is presented which indicates a relationship between *Ochropsora* and *Tranzschelia*. The latter is considered to belong to the sub-family Phragmidiatæ and it is suggested that the 2 genera may have arisen from a closely related form but show divergent development, especially in the telial stage.—*H. S. Jackson.*

1957. ESSIG, FREDERICK MONROE. The morphology, development, and economic aspects of *Schizophyllum commune* Fries. *Univ. California Publ. Bot.* 7: 447-498. *Pl.* 51-61. 1922.—In summarizing the morphology and development of *Schizophyllum* it may be said that: (1) The sporophores vary greatly as to form and shape. (2) The segments of the mycelium and sporophores, and spores are regularly binucleate. (3) The fungus develops its sporophores as does no other member of the Hymenomycetes so far studied, the hymenium primordium arising in an apical cavity. (4) The "gills" arise upon the surface of an apical depression due to tensions set up by unequal rates of growth. (5) The "lamellæ" are such by analogy only, being the edges of smooth hymenial areas, and therefore *Schizophyllum* belongs in the

family Thelephoraceae.—As regards the economic aspects of *Schizophyllum*, it has been shown that: (a) Members of this genus are found throughout the tropical and temperate zones of the world. (b) They live upon a great number of woody dicots, monocots and gymnosperms. (c) The fungus possesses unusual vitality. (d) The mycelium is found only in small amount in infected wood. (e) It can grow upon fresh wood, and, under very favorable conditions, living wood. (f) Natural infection takes place through some injured or weakened part of the tree. (g) The fungus is usually associated with other parasitic fungi, which probably do most of the damage attributed to *Schizophyllum* but escape attention due to the longer time necessary for them to produce fruit-bodies.—W. A. Setchell.

1958. FONTOYNONT, M., et PAX SALVAT. Lésions mycosiques dues au *Saccharomyces granulatus* observées à Tananarive (Madagascar). Leur guérison par le bleu de méthylène. [Fungous lesions due to *Saccharomyces granulatus* observed at Tananarive, Madagascar. Their cure by means of methylene blue.] Bull. Soc. Path. Exotique 15: 53-59. Pl. I. 1922.—Lesions produced on various parts of the body of a native woman were found to be caused by *Saccharomyces granulatus*. The macroscopic and microscopic details of the organism are not dealt with. The reader is referred to a paper by Vuillemin and Legrain [Arch. Parasitol. 1900] for this information. The authors deal mainly with the symptoms of the disease and its treatment with methylene blue.—G. H. Godfrey.

1959. HEDGCOCK, GEORGE G., and N. REX HUNT. Notes on some species of *Coleosporium*.—II. Mycologia 14: 297-310. Pl. 22-23. 1922.—This is principally a record of inoculation experiments with the following: *Coleosporium Ipomoeae*, *C. ribicola*, and *C. Solidaginis*, the last being considered as made up of 2 distinct forms, one occurring on *Solidago* and the other on *Aster*. Successful infections with aeciospores of *Coleosporium Ipomoeae* were obtained on *Ipomoea caroliniana*, *I. lacunosa*, *I. pandurata*, *Pharbitis barbigera*, *P. hederacea*, and *Quamoclit coccinea*. The aecial stage is now known to occur on 6 species of pine of which *Pinus echinata* is "the most common and susceptible host species." *Coleosporium ribicola* has been successfully inoculated on *Pinus edulis*, *P. pinea*, *Grossularia divaricata*, *G. hirtella*, *G. reclinata*, *G. inermis*, *G. innominata*, *G. missouriensis*, *Ribes americanum*, *R. aureum*, *R. fasciculatum*, *R. inebrians*, *R. nigrum*, *R. odoratum*, and *R. vulgare*. *Coleosporium Solidaginis* has been found occurring naturally on about 60 species of *Solidago* and is now reported on the following new hosts: *S. amplexicaulis*, *S. austrina*, *S. bootii*, *S. brachyphylla*, *S. celtidifolia*, *S. chandonnetii*, *S. Chapmanii*, *S. concinna*, *S. Curtissii*, *S. decumbens*, *S. Drummondii*, *S. erecta*, *S. fistulosa*, *S. glomerata*, *S. hispida*, *S. lancifolia*, *S. odora*, *S. petiolaris*, *S. pinensis*, *S. pinetorum*, *S. pulverulenta*, *S. Purshii*, *S. rigida*, *S. rigidiuscula*, *S. speciosa*, *S. stricta*, *S. tortifolia*, *S. unigulata*, and *S. vaseyii*. The *Coleosporium* occurring on *Aster* "is apparently distinct from *C. Solidaginis*." It is known to occur on at least 60 species and is now reported for the first time on the following: *Aster acuminatus*, *A. concinnus*, *A. corrigiatus*, *A. hirsuticaulis*, *A. junceus*, *A. lowrieanus*, *A. oblongifolius*, *A. patulus*, *A. Pringlei*, *A. schistosus*, *A. spectabilis*, *A. tenuicaulis*, *A. Fremontii*, *A. frondosus*, and *A. viscosum*. The *Solidago* form of *Coleosporium Solidaginis* has been successfully inoculated on *Pinus caribaea*, *P. Coulteri*, *P. echinata*, *P. nigra-austriaca*, *P. radiata*, *P. rigida*, *P. scopulorum*, and *P. taeda*.—H. R. Rosen.

1960. ITO, S. A preliminary report on the Japanese species of *Uromyces*. Ann. Mycol. 20: 81-85. 1922.—A list of 56 Japanese species of *Uromyces* is given with synonymy. Eight species new to the flora of Japan are included. *Uromyces Viciae-unjugae* on *Vicia unijuga* Ait. is described as a new species. *U. mercurialis* P. Henn. on *M. leiocarpa* S. & Z. is redescribed.—H. S. Jackson.

1961. IYENGAR, M. O. PARTHASARATHY, and M. J. NARASIMHAN. A new species of *Schizonella*. Phytopathology 12: 435-438. Fig. 1-4. 1922.—A fungus, which is here described as *Schizonella Colemanii* n. sp., was found producing a witches broom on *Vitis quadrangularis* Wall.—B. B. Higgins.

1962. KEISSLER, K. Mykologische Mitteilungen. [Mycological contributions.] Ann. Naturhist. Mus. Wien 35: 1-35. 1922.—This is the 1st of a series of papers in which new forms are to be described and critical revisions of known groups given. The 1st part of the article is devoted to new forms as follows: *Pleospora* (?) *Ranunculi* on *Ranunculus Huetii* Boiss.; *Thyrsidium botryosporum* Mont. f. *verrucosa* on the bark of *Aleurites moluccana*; *Brachysporium obovatum* (Berk.) Sacc. var. *Clematidis* on dry branches of *Clematis recta* L.; *Mollisia Potentillae* on dry leaves of *Potentilla argentea*; *Rhabdospora Bornmülleri* on sheaths of *Ranunculus Huetii*. In the 2nd part of the article appear the following new combinations: *Phaeosporella Cassiopes* (Rostr.); *Chaetosphaeria Epochenii* (B. & Br.); *Sphaerulina Porotheia* (B. & C.); *Ascophanus minutissimus* Boud. var. *Coemansii* (Boud.); *Plicaria granulosa* var. *Boudieri* (Cke.); *P. olivacea* (Boud.); *Pustularia vesiculosa* var. *Stevensonii* (Ell.); *Helvella atra* var. *murina* (Boud.); *Ascochyta Frazini* (Desm.); *A. pterophila* (Fautr.); *A. Ulmi* (West.); *Ascochyta ulmella* (Sacc.); *Phomopsis mahoniaecola* (Pass.); *Phyllosticta mahoniae* (Thuem.); *Coniothyrium Campanulae* (Sacc. & Speg.); *C. discincola* (E. & E.); *C. orbicula* (E. & E.); *Botryodiplodia platanicola* (Sacc.). In the discussion of the above forms the names of the following genera also appear: *Didymosphaeria*, *Melanomma*, *Sphaeria*, *Cantharina*, *Glonium*, *Peziza*, *Aleuria*, *Leptopodia*, *Verpa*, *Diplodia*, *Phoma*, *Hendersonia*, *Hyalothyridium*, *Ovularia*, *Papularia*, *Ramularia*. The following are described as new: *Phyllosticta Spegazziniana*, *Diplodia Berkeleyi*, *Hendersonia dianthicola*, *Acetabula vulgaris* f. *pallescentis*, *A. vulgaris* f. *Barlae* (Boud.).—A. S. Hitchcock.

1963. KRIEGER, LOUIS C. C. A sketch of the history of mycological illustration (higher fungi). *Mycologia* 14: 311-330. Pl. 24-31. 1922.

1964. KURSANOV, L. Recherches morphologiques et cytologiques sur les Urédinées. [Morphological and cytological researches on the Uredineae.] Bull. Soc. Nat. Moscou 31: 1-129. Pl. 1-4. 1917 [1922].—This work represents a modification of a dissertation by the same author (in Russian, 1915). It is abridged in part, chapters 6-9 and the historical review of the literature being omitted. It is augmented by new and recent observations by the author. For example he describes among aecidial forms normally binucleate new forms with uninucleate aecidia, *A. leucospermum* on *Anemone ranunculoides*. The uninucleate spores germinate by germ tubes likewise uninucleate but infection experiments gave negative results. The author also describes the development of the aecidial fructification, little known up to the present, of the *Peridermium* type, *Peridermium Strobi*, and of the *Roestelia* type, *Gymnosporangium juniperinum*. He describes the development of *Puccinia gageae*, *Uredo Pirolae*, etc.—The conclusions arrived at in this work are in general the same as those in the Russian publication, viz.: (1) Among the different types of aecidial fructifications the aecidium is the primitive type and the caecoma, of more primitive structure, is the result of a regressive evolution. (2) The aecidial fructifications and the primary sori of short cycled rusts are homologous. (3) The contemporaneous short cycled rusts are regressive but not primitive. (4) The "sexual process" in the Uredineae is not a fertilization but apogamy. (5) The initial forms for the further evolution of the rusts belong to the type *Endo-Uredinalis* (Barclay-Grove hypothesis) and are similar to but not identical with *Endophyllum*.—S. Satin.

1965. ЛЕБЕДЕВА, Л. А. [LEBEDIEVA, L. A.]. Микофенологическія наблюденія въ Ларкѣи Оранжерейхъ Главнаго Ботаническаго Сала. [Mycophenological observations in the park and greenhouses of the Botanical Garden of Petrograd.] Ботаническіе Матеріалы Института Споровыхъ Растеній Главнаго Ботаническаго Сада Въ петроградѣ [Notulae Systematicae Inst. Crypt. Hort. Bot. Petropolitani] 1: 62. 1922.—The author has undertaken the work of collecting and studying from the morphological, physiological, and phenological points of view the fungi growing in the Botanical Garden of Petrograd. It is to be expected that the mycological flora of such a garden will show a great variety of forms, considering the great number of imported plants and the special conditions in the greenhouses. Five species are enumerated and several observations concerning them are given. The species *Sphaeropsis suspecta* Vestregren, *Phoma thallina* Sacc., and *Cytospora Corni* West, were found in the open

on branches of *Cornus sanguinea*. *Phoma thallina* [not *thalina* as written by the author] is considered as a parasite producing the same symptoms as *Sphaeropsis suspecta*. *Gloeosporium Cattleyae* Sacc. was found in the greenhouse on leaves of orchids (*Cattleya*, *Laelia*, *Lycaste*); the 2 last-named are new hosts for this species. The development of this fungus ceases during the winter and begins again in the spring. *Gloeosporium elasticae* Cooke has been found in the same greenhouse on *Ficus* sp.—A. Jacewski.

1966. Лебедева, Л. А. [LEBEDIEVA, L. A.] О новых Видѣхъ Грибовъ, Собранныхъ Въ Ставропольской Губ. Въ 1916. Матеріалы по обелѣдованію Микологическому Россіи. [New species of fungi from North Caucasus. 1916. Materials for mycological investigations in Russia.] Vol. V, No. 3. Botanical Garden, Petrograd, 1921.—Twelve parasitic or saprophytic micro-fungi hitherto undescribed are enumerated: (1) *Stigmatea Scabiosae* on leaves of *Scabiosa ucrainica*; (2) *Pleosphaerulina Lini* on leaves and stems of *Linum perenne*; (3) *Pleosphaerulina Euphorbiae* on living leaves of an *Euphorbia*; (4) *Mycosphaerella glycyrrhizae* on dead leaves of *Glycyrrhiza glabra*; (5) *Mycosphaerella Phlomidis* on wintered leaves of *Phlomis pungens* infected with *Septoria Phlomidis* Bond. & Lebedieva, which is very probably its pycnidial stage; (6) *Dothidella Thalictri* on dead leaves of *Thalictrum minus*; (7) *Hendersonia Tragopogonis* on dry stems of *Tragopogon major*; (8) *Hendersonia Zygothylli* on dead leaves of *Zygothyllum Fabago*; (9) *Septoria Cucubali* on living leaves of *Cucubalus baccifer*; (10) *Naemospora Rubi* on dead stems of *Rubus idaeus*. (Very probably this is a synonym of *Cytospora Rubi* Schweinitz on the same host cited in North America, but with a very incomplete description. In Europe there is another *Cytospora* on *Rubus idaeus*, *Cytospora ambiens* Sacc., but with quite different stylospores.) (11) *Ramularia Lini* on living leaves and stems of *Linum perenne*; (12) *Ramularia Lithospermi* on living leaves of *Lithospermum officinale*. For all the species complete Latin diagnoses are given.—A. Jacewski.

1967. LUPO, PATSY. Stroma and formation of perithecia in *Hypoxylon*. Bot. Gaz. 73: 486-495. Pl. 18. 1922.—Material from Ohio of *H. coccineum* was studied. The stroma shows 4 distinct regions. Its firm structure is "gained by many mechanical devices for support, such as tubular extensions from cells, branching and intertwining of hyphae and special articulation surfaces." The hyphae are differentiated into 3 types from the time of their emergence from the substratum; those that form the major part of the stroma, those that form the perithecia and Woronin hyphae, and those that form the superficial layers and probably the conidiophores. The cells of the hyphae are originally binucleate, but may become multinucleate. The formation of the perithecia is initiated by the massing of the hyphae into a circular knot, within the center of which the Woronin hyphae differentiate. The ascogonia develop from the cells of the Woronin hyphae by rounding out, partially separating from each other, and increasing in size. The ascogonia do not drop to the bottom of the perithecium in the older stages but come to lie comparatively closer to the bottom by an expansion of the perithecial wall toward the periphery of the stroma. The nuclear program within the ascogonia is one of few divisions and great increase in size, up to the stage where the ascogonia are well rounded out, and then of rapid division without the maintenance of size. The ascogonium buds out protuberances that are the beginnings of the ascogenous hyphae.—B. W. Wells.

1968. MARTIN, G. W. Morphology and cytology of fungi. [Rev. of: GWYNNE-VAUGHAN, DAME HELEN. Fungi. Ascomycetes, Ustilaginales, Uredinales. xi + 232, 196 fig. Cambridge, 1922 (see Bot. Absts. 11, Entry 4253).] Bot. Gaz. 74: 114-115. 1922.—A few details are criticized by the reviewer. He thinks the author's implication that the phenomenon of 2 nuclear fusions is the normal situation in Ascomycetes is premature. Further, the author's interpretation of clamp connections as structures which have no significance other than to facilitate the passage of food or simply as a vegetative phenomenon is criticized as a statement which will need revision. The reviewer argues against changing the current notion of the basidium in the Uredinales, which the author apparently does when she regards the teleospore cell as involved in the basidium. A final general commendatory statement is made in which the reviewer states that the author "has performed an invaluable service in

collating this work and presenting it so clearly and concisely. The book is a necessity for the reference shelf of every laboratory where mycology is taught." [See also Bot. Absts. 11, Entry 4247.]-B. W. Wells.

1969. MOREAU, FERNAND. *Le mycélium à boucles chez les Ascomycètes.* [The mycelium with clamp connections in the Ascomycetes.] *Compt. Rend. Acad. Sci. Paris* 174: 1072-1074. 1922.—The occurrence of clamp connections on the sides of hyphae at the transverse walls, which is generally considered to be a characteristic of Basidiomycetes, is now found to exist in the Ascomycetes. The hyphae of *Parmelia Acetabulum*, a lichen, are described in this connection. The clamps are shown to have a direct relation to ascus formation, and to be formed on binucleate cells only. It is suggested that this presents evidence as to the closer relationship of the Ascomycetes and Basidiomycetes.—C. H. Farr.

1970. MURRILL, WILLIAM A. *Index to illustrations of fungi, XXIII-XXXIII.* *Mycologia* 14: 332-334. 1922.—This is an index to the illustrations of higher fungi published by the writer in *Mycologia* since 1916.—H. R. Rosen.

1971. Нагорный, Л. И. N[AGORNY, P. I.] *Материалы Для Головных Кавказа.* [Contribution to the knowledge of the Ustilaginales of the Caucasus.] *Вѣстникъ Тифлискаго Сада Тифлисъ* [Bot. Gard. Tiflis Bull.] 51. 1920.—Dr. Nagorny, for several years chief of the mycological laboratory of the plant disease station at Stavropol in North Caucasus, went during the war to Tiflis as chief of the Caucasian bureau of plant diseases, and pursued there his mycological work, one of the results being here published. He gives an enumeration of 25 smuts of the Caucasus, with indications of their habitat and distribution and with critical remarks; most of the enumerated species are common, but some of them are considered as rare. One of these, *Entyloma Thalictri* Schröter described from Silesia on *Thalictrum minus*, does not seem to be very common throughout Europe, having been found subsequently only in Switzerland by Schellenberg on the same host. In North America the species seems to be rather common, and according to Clinton occurs on different species of *Thalictrum*. In Russia it is reported from different localities in European provinces (Smolensk, Orel, Kursk, Tambov) and also in Siberia (Altai), not only on *T. minus* but also on *T. aquilegifolium*. It has been distributed in 2 Russian exsiccatae (Transchel & Seriebriannikov, *Mycotheca Rossica* No. 255, and Buchholtz, *Herb. of Russian Fungi* No. 615). Nagorny indicates it for the Caucasus on *T. minus* and on *T. sp.* The species is decidedly more widely distributed in western Europe, —another example of the great similarity of the North American and Russian mycological floras that have their connection in Siberia. Nagorny presents a new species, *Tilletia Narduri* on *Nardurus sp.*, collected in 1914 by G. Woronow, in Eriwan. [I may mention that specimens of this species were sent to me by Mr. Woronow, and in examining them I came to the conclusion it was a new species of *Tilletia* and named it *T. Narduri*, but as I was neither able to publish nor to correspond with Woronow, my name became a *nomen nudum*, and Nagorny now has full claim to priority. I would not mention a detail of such small importance but for the fact that Nagorny reports his *Tilletia Narduri* on *Nardurus sp.* In my specimens the label written by Woronow himself mentions *Nardurus persica* as the host plant. In 1914 Mr. Sigrianski, assistant of botany at Voroneje, found in the province of Voroneje a new *Tilletia* on *Lepturus panonicus* and labelled it *Tilletia Lepturi* Sigr. This species is morphologically very near and perhaps identical with *T. Narduri*.]—A. Jacewski.

1972. Оль, И. А. [OHL, I. A.] *Новый грибокъ, ларазтирующій на коробоукауъ мха Polytrichum gracile Dicks.* [A new fungus parasite in the capsules of the moss *Polytrichum gracile*.] *Ботанические Материалы Института Словныхъ Главнаго Ботаническаго Сада.* [Notulae Systematicae Inst. Crypt. Hort. Bot. Petropolitani] 1: 46. 1922.—A new species of *Stagonospora*, occurring in the capsules of *Polytrichum gracile* collected by W. L. Komarov in the summer of 1913 in South-Oussuri (oriental Siberia) is described. It is very different from the *Stagonospora Rawii* (Ellis) Saccardo, known in North America on *Polytrichum formosum*, the stylospores being $37.5-44.5 \times 6.5-7.5 \mu$ and 5-7 septate. A very thorough description

is given in Russian accompanied by a briefer Latin diagnosis. The species is named *Staganospora Komarowii*.—A. Jacewski.

1973. ОЛЬ, И. А. [OHL, I. A.] *Phyllosticta Semeles* Ohl nov. sp. Новый ларазитъ Живыхъ листьевъ *Semele androgyna* Kunth. [*Phyllosticta Semeles*, a new parasite on living leaves of *Semele Androgyna* Kunth.] Ботанические Материалы Института Словарь Растений Главнаго Ботаническаго Сада въ Петроградѣ. [Notulae Systematicae Inst. Crypt. Hort. Bot. Petropolitani] 1: 60. 1922.—A description and Latin diagnosis are given of a new species of *Phyllosticta* on living leaves of *Semele androgyna*. Numerous whitish spots limited by a red border and containing many pycnidia are developed on the upper surface of the leaves. The stylospores are ellipsoidal, hyaline, $3.5-5 \times 1.5-2.5 \mu$. The only other fungus known on this host is *Ascochyta Semeles* Saccardo, producing very similar spots and identical pycnidia, but with uniseptate, pale olive, fusiform stylospores measuring $8-9 \times 3 \mu$. Considering the similarity of *Ascochyta Semeles* and *Phyllosticta Semeles* the author is inclined to regard these forms as stages of 1 species, and will continue his observations in order to settle the question.—A. Jacewski.

1974. PATTERSON, FLORA W., W. W. DIEHL, and EDITH K. CASH. A list of fungi (Ustilaginales and Uredinales) prepared for exchange. U. S. Dept. Agric. Dept. Circ. 195. 50 p. 1922.—The list comprises 950 numbers.—L. R. Hesler.

1975. PETERSEN, SEVERIN. Agaricaceer iagttagne i Omegnen of Sorø i Juli Maaned 1918-19-20. [Agaricaceae collected in the vicinity of Sorø during the month of July 1918, 1919, 1920.] Bot. Tidskr. 37: 312-315. 1922.—The month of July offers favorable conditions in the vicinity of Sorø for the development of Agaricaceae. For the 3 years Petersen made daily collections. He lists these as he found them from day to day and later makes a systematic classification.—A. L. Bakke.

1976. PETRAK, F. Beiträge zur Pilzflora von Albanien und Bosnien. [Contribution to the fungus flora of Albania and Bosnia.] Ann. Mycol. 20: 1-28. 1922.—About 225 miscellaneous fungi collected in 1918 by the author are enumerated with occasional notes and descriptions. The following species are described as new: *Diaporthe Psoraleae-bituminosae* on stems of *Psoralea bituminosa*; *Lophodermium iridicolum* on decaying leaves of *Iris* sp.; *Cytospora bosniaca* on twigs of *Rosa* sp.; *Diplodia cynanchina*, *Macrophoma cynanchina*, and *Phomopsis cynanchina* on stems of *Cynanchum acutum*; *Microdiplodia Calamagrostidis* on leaves of *Calamagrostis* sp.; *Phoma albanica* on *Spartium junceum*; *Phyllosticta Inulae-viscosae* on leaves of *Inula viscosa*; *Phyllosticta Staticis* on leaves of *Statice* sp.; *Sclerophoma confusa* on twigs of *Buxus sempervirens*; *Septoria albanica* on leaves of *Brachypodium silvaticum*; *Staganospora albanica* on leaves of *Brachypodium silvaticum*; *S. calamagrosticola* on leaves of *Calamagrostis* sp.—H. S. Jackson.

1977. PETRAK, F. Beiträge zur Pilzflora von Mähren und Osterr.—Schlesien. V. [Contribution to the fungus flora of Moravia and Austrian Silesia.] Ann. Mycol. 19: 274-295. 1921.—The article consists of a list, with occasional notes and descriptions, of about 220 fungi, chiefly Uredinales, Ascomycetes, and Fungi Imperfecti. The following species are described as new: *Mycosphaerella eupatoriicola* on stems of *Eupatorium cannabinum*; *Ascochyta lupinicola* on *Lupinus* sp.; *Ascochyta Asparagina* on stems of *Asparagus officinalis*; *A. moravica* on stems of *Centaurea scabiosa*; *Dendrophoma emericola* on twigs of *Coronilla emerus*; *Diplodia Genistae-tinctoriae* on *Genista tinctoria*; *Microdiplodia cornicola* on twigs of *Cornus sanguinea*; *M. evonymella* on *Evonymus europea*; *M. quercicola* on *Quercus* sp.; *M. Rhamni* on *Rhamnus cathartica*; *M. ribicola* on *Ribes rubrum*; *Phoma Genista-tinctoriae* on *Genista tinctoria*; *P. Ribis-grossulariae* on *Ribes grossularia*; *Rhabdospora hranicensis* on stems of *Leucanthemum vulgare*; *Septoria torilicola* on *Torilis authriscus*.—H. S. Jackson.

1978. REA, CARLETON. **British Basidiomycetae.** *Demy 8 vo., xii + 800 p.* Cambridge Univ. Press: London, 1922.—This is a handbook to the larger British fungi, published under the auspices of the British Mycological Society. The work is based chiefly on the system set forth by N. Patouillard in his *Essai Taxonomique sur les Familles et les Genres des Hyménomycètes*, published in 1900.—*D. S. Welch.*

1979. Сатина, Софія. [SATIN, SOPHIE.] **Исторія розвитку перитеція *Nectria Peziza* (Tode.)** [Development of the perithecia of *Nectria Peziza* (Tode.)] Журнал Русского Ботанического Общества [Jour. Russian Bot. Soc.] 2: 30-45. *Fig. A-B, 1-19.* 1917. [Printed in 1919 in Russian with a French résumé].—A spiral, multicellular ascogonium is developed; an antheridium is absent. Division of nuclei in the cells of the ascogonium occurs and mitotic figures are pictured. The writer holds the view of Claussen with reference to a fusion of nuclei in the ascogonium.—*H. M. Fitzpatrick.*

1980. Сатина, Софія. [SATIN, SOPHIE.] **Оплідотвореніє ч історія розвитку *Cubonia brachyasca* Sacc.** [Fertilization and life-history of *Cubonia brachyasca* Sacc.] Журнал Русского Ботанического Общества. [Jour. Russian Bot. Soc.] 4: 77-94. 2 pl. 1918/1919 [1921].—*Cubonia brachyasca* Sacc., a very rare coprophilous fungus belonging to the Ascobolaceae, was found by the author on horse dung sent from Siberia to the Botanical Laboratory of the Women's University of Moscow. *Cubonia* was cultivated on dung agar, and usually numerous apothecia reached maturity on cultures 4-5 days old. The presence of bacteria was necessary for their development. Changing the conditions of light, temperature, and medium had no influence on the fructification. The ascocarp originates from a pair of morphologically distinct sex cells and fertilization takes place. The spirally coiled ascogonium is composed of 3 parts: (a) the 1-celled trichogyne, bent like a hook; (b) the oogonium, easily distinguished by its large dimensions and dense contents; and (c) the several-celled stalk. The many-celled antheridium twists around the ascogonium and its terminal cell fuses with the apex of the trichogyne. After fertilization has taken place these cells become empty and degenerate. The fertilized oogonium enlarges and soon a considerable number of ascogenous hyphae grow out and form asci. The poorly developed peridium is formed from hyphal branches which originate from the cells of the stalk; it does not usually develop before the ascogenous hyphae appear. The process of fertilization and the greater part of the gradual development of the ascocarp can thus be observed in the living state. All the cells of *Cubonia* are multinucleate. There is no evident difference between the male and female nuclei. No fusion occurs in the oogonium, the fusion in the ascus hook being the only one in the life-cycle.—*Sophie Satin.*

1981. Сатина, Софія. [SATIN, SOPHIE.] **Къ історіі розвитку *Phacidium repandum*.** [The life-history of *Phacidium repandum*.] Журнал Русского Ботанического Общества. [Jour. Russian Bot. Soc.] 4: 95-102. 1 pl. 1918/1919 [1921].—The apothecia and pycnidia of this parasitic fungus develop on living leaves of *Galium rubigoides*; both appear in early spring but the pycnidia predominate in the 1st part of summer, the apothecia in the 2nd. They develop independently below the stomata. *Phacidium repandum* is apogamous; there are no male cells. The development progresses as follows: Several vegetative hyphae begin to grow strongly under a stomate and form a stromatic tissue. Soon several ascogonia are differentiated in this more or less well-developed tissue. Each of these consists of a row of coiled cells filled with dense protoplasm. The terminal cells of these ascogonia pass through the stomate; they are considered as functionless trichogynes, 6-8 often passing through a single stomate. The cells of the ascogonium bud and form ascogenous hyphae with asci. Part of the stromatic tissue forms the peridium. The fruit-body increasing in size reaches maturity, ruptures the epidermis of the host plant, and appears on the surface of the leaf. The cytology has not been investigated. The cells of the ascogonium are uninucleate.—*Sophie Satin.*

1982. SCHINZ, HANS. **Der Pilzmarkt der Stadt Zurich der Jahre 1918 und 1919 im Lichte der städtischen Kontrolle.** [The mushroom market of the city of Zurich in the years 1918 and

1919 in the light of city supervision.] Vierteljahrsschr. Naturf. Ges. Zurich 65: 530-544. 1920. The author gives lists of mushrooms offered for sale and the approximate quantities sold of each species. The characters by which wholesome species may be segregated rapidly from poisonous and disagreeable species are briefly considered.—*John H. Schaffner*.

1983. SIKORA, H. Voläufige Mitteilung über Mycetome bei Pediculiden. [Preliminary report upon the occurrence of a mycetome in Pediculidae.] Biol. Centralbl. 39: 287-288. 1919.—The author announces his conclusion that the long recognized "Magenscheibe," or glandlike organ, found in certain Pediculids (head louse, clothes louse, felt louse, and rat louse) is really a fungous filament-harboring organ or mycetome in which at certain stages in the embryonal life of these insects develops an abundance of mycelium of significance in a symbiotic relation. In embryonic stages of the swine louse a homologous organ is also found, which, however, is not seen in the mature louse. The author believes this mycetome to be present in other species of lice and announces early publication of his investigations in full. [See also Bot. Absts. 12, Entry 1955.]—*William L. Bray*.

1984. SYDOW, H. Bemerkungen zu einer Anzahl in letzter Zeit als neu beschriebener Pilze der Philippinen-Inseln. [Observations on some fungi recently described as new from the Philippine Islands.] Ann. Mycol. 20: 66-73. 1922.—Notes are given on 23 recently described fungi, most of which are considered to be identical with previously described forms. A few are redescribed.—*H. S. Jackson*.

1985. SYDOW, H. J. Bornmüller: Plantae Macedoniae. Pilze. [J. Bornmüller: Plants of Macedonia. Fungi.] Ann. Mycol. 19: 243-254. 1921.—A list is given, with occasional notes, of 81 fungi (mostly parasitic) in various groups based on the collections of J. Bornmüller. The following new species are described: *Uromyces Hippocrepidis* on *Hippocrepis ciliata*; *Puccinia Lolii* on *Lolium perenne*; *Coleosporium Asterisci-aquatici* on *Asteriscus aquaticus*; *Aecidium macedonicum* on *Asyneuma limonifolium*.—*H. S. Jackson*.

1986. SYDOW, H. Mycotheca Germanica Fasc. XXIX-XXXVI (No. 1401-1800). Ann. Mycol. 19: 132-144. 1921.—A numerical list is given of the fungi included in the exsiccati. Critical notes are given on 14 of the species included. Descriptions are given for the following new species or varieties: *Mycosphaerella Deutziae* on leaves of *Deutzia Lemonii*; *M. equisetina* on culms of *Equisetum hiemale*; *M. Thelypteridis* on dead fronds of *Aspidium Thelypteris*; *Microthyrium culmigenum* on culms of *Calamagrostis lanceolata*; *Hysterostegiella Typhae* on leaves of *Typha angustifolia*; *Excipula Kriegeriana* on stems of *Sisymbrium strictissimum*; *Helotium herbarum* (Pers.) var. *carpogenum*, and *H. stutula* (Pers.) Karst. var. *aesculicarpa* on fruit hulls of *Aesculus Hippocastanum*; *Septoria Glaucis* on leaves of *Glaux maritima*; *Phleospora Ludwigii* on leaves of *Salix repens*; *Oospora marchica* on dead petioles of *Robinia pseudo-acacia*; *Didymaria Matricariae* on leaves and stems of *Matricaria discordea*; *Septoria Matricariae* on leaves of *Matricaria Chamomilla*; *Cercospora Ectii* on leaves of *Echium vulgare*. *Stegia Caricis* Pk. is transferred to the genus *Hysteropezizella* and *Leptothyrium asterinum* Berk. & Br. is transferred to *Macrophoma*.—*H. S. Jackson*.

1987. SYDOW, H. Novae fungorum species XVII. [New species of fungi XVII.] Ann. Mycol. 19: 305-309. 1921.—The following new species are described: *Aecidium prolixum* on *Wrightia lanita* from the Philippines; *Meliola guamensis* on *Ochrosia* sp. from Guam; *Nummularia patella* on dead wood from the Philippines; *Cryptosphaeria cubensis* on dead branches of *Acacia Farnesiana* from Cuba; *Didymella Caricis* on dead leaves of *Carex lepidocarpa* from Kurland; *Gibbera aequatoriensis* on leaves of *Cestrum* sp. from Ecuador; *Bombardiastrum javanicum* on dead branches of *Rauwolfia javanica* from Java; *Rosenscheldiella Litseae* on leaves of *Litsea glauca* from Japan; *Asterina Balii* on leaves of *Alangium Lamarkii* from India; *A. delicatula* on leaves of *Aegle marmelos* from India; *Phaeociboria brasiliensis* on inflorescence of *Pinus* from Brazil; *Ustilaginoides borneensis* on heads of *Ischaemum aristatum* from North Borneo. A new genus, *Thyrosema*, of the Microthyriaceae, based on *T. pulchellum* n. sp. on leaves of *Erythroxylon* from Amboina is described and its relationship discussed.—*H. S. Jackson*.

1988. SYDOW, H. The Amboina fungi collected by C. B. Robinson. *Philippine Jour. Sci.* 21: 131-146. 1922.—Seventy species are enumerated, the following being described as new: *Meliola Eugeniae*, *M. amboinensis*, *M. pachychaeta*, *M. Stemonae*, *M. Robinsonii*, *M. megalochaeta*, *M. odontochaeta*, *Diathrypton* (gen. nov.) *amboinense*, *Catacauma microplacum*, *C. Robinsonii*, *Trabutia amboinensis*, *Asterina spectabilis*, *A. venustula*, *A. assimilis*, *Prillieuxina Loranthi* comb. nov. (*Asterinella Loranthi*), *P. microspila*, *P. amboinensis*, *Parasterina melanochetes*, *Calothyrium vile*, *Lembosia Robinsonii*, *Echidnodes xenospila*, *Thyrosoma* (gen. nov.) *pulchellum*, *Byssogene* (gen. nov.) *amboinensis*, and *Asteromella polystigma*.—E. D. Merrill.

1989. SYDOW, H. Über einige wenig bekannte Uredineen aus dem Kew Herbar. [Concerning some little known Uredinaceae from the Kew Herbarium.] *Ann. Mycol.* 20: 54-60. 1922.—The author reports on the result of an examination of the original specimens of 19 species of *Uromyces* and *Puccinia* chiefly named by Berkeley or Cooke. A redescription of each valid species is given. *Uromyces Diploglottidis* Cke. & Mass. is transferred to the genus *Ctenoderma*. Several species are considered synonymous with species previously or subsequently described.—H. S. Jackson.

1990. SYDOW, H. Über einige weitere im südlichen China (Kwangtung-Provinz) gesammelte Pilze. [Concerning some additional fungi collected in southern China.] *Ann. Mycol.* 20: 61-65. 1922.—A report is given of 2 collections of fungi made by E. D. Merrill and C. W. Howard. A total of 31 species is listed. The following new species are described: *Aecidium Raphiolepidis* on *Raphiolepis indica*; *Meliola leptoclada* on *Schefflera octophylla*; *Englerulaster sinensis* on *Ilex ficoidea*; *Melasmia Alni* Syd. on *Alnus* sp.; *Puccinia polystegia* on *Daedalacanthus nervosus*; *Phyllachora pennisetina* on *Pennisetum alopecuroides*, *Cercospora atrides* on *Bridelia monoica*; *C. micromera* on *Sapium sebiferum*. A new genus of Fungi Imperfecti, *Elaeodema* based on *E. Cinnamemi* n. sp. on fruits of *Cinnamomum pedunculatum*, is described.—H. S. Jackson.

1991. VUILLEMIN, PAUL. Relations entre les chlamydospores et les boucles mycéliennes. [The relation between chlamydospores and clamp-connections.] *Compt. Rend. Acad. Sci. Paris* 174: 1148-1149. 1922.—The clamps are formed by a process which is intermediate between exogamy and endogamy. They are homologous to the ascus hooks of the ascomycetes. They are found on the binucleate mycelium which characterizes the diplo-phase of both ascomycetes and basidiomycetes. In some forms, chlamydospores bear the same relation to the asci and basidia as do the clamps. It is believed that the production of clamps is not necessary to the development of asci and basidia. The chlamydospores of *Nyctalis Asterophora* are homologous to the clamps of *N. parasitica*. In like manner the chlamydospores of *Bornetina Corium* are homologous to the clamps of *B. aurea*.—C. H. Farr.

1992. VUILLEMIN, PAUL. Une nouvelle espèce de *Syncephalastrum*; affinités de ce genre. [A new species of *Syncephalastrum*; the affinities of the genus.] *Compt. Rend. Acad. Sci. Paris* 174: 986-988. 1922.—This new species is parasitic on *Rhizopus*. It is concluded that this genus should be classified in the tribe Absideae of the Mucoraceae.—C. H. Farr.

1993. WELLES, C. G. A provisional list of the parasitic fungi of the Philippine Islands. *Philippine Agric. Rev.* 15: 149-202. 1922.—About 958 species in 260 genera are listed, with their recorded hosts. A host index and an index to genera and families are given. No bibliographic references are included.—E. D. Merrill.

1994. WILSON, GUY WEST. Notes in some fungi from Eastern Kansas. *Trans. Kansas Acad. Sci.* 30: 171-174. 1919/21 [1922].—This is an annotated list of 43 species, chiefly from the vicinity of Lawrence.—F. C. Gates.

1995. WILSON, MALCOLM. A new species of *Phomopsis* parasitic on the Douglas fir. Trans. and Proc. Bot. Soc. Edinburgh 28: 47-49. 1920.—*Phomopsis Pseudotsugae*, attacking Douglas fir, *Pseudotsuga taxifolia* (= *Douglasii*), is described. It attacks the leading shoots and also the trunks of young trees and causes their death. It appears to be widely distributed in Scotland.—*Roxana Stinchfield Ferris*.

1996. Воронихинъ, Н. Н. [WORONICHIN, N. N.] Къ флорѣ *Phycomycetes* Кавказа. [Contribution to the phycomycetous flora of the Caucasus.] Вѣстникъ Тифлискаго Ботаническаго Сада Тифлисъ [Bot. Gard. Tiflis Bull.] 50. 1920.—The Mycological Flora of the Caucasus has been very thoroughly investigated in the last 25 years and mycologically this region is one of the best known in Russia. Not all the groups of fungi have been equally investigated, and the aquatic fungi have been little known. In this pamphlet the author pays special attention to these and has identified 9 species, belonging to the Chytridineae (4), Ancylistineae (4), and Pythiaceae (*Pythium gracile*). *Lagenidium papillosum* Cocc. on *Spirogyra* is reported from Russia for the 1st time, being known previously only from Italy. In *Pythium gracile* oospores, previously unknown in the species, were found in great number; they are spherical, hyaline, smooth, and measure 8-15.8 μ (usually 12.6-14 μ). *Pythium tenue* Gobi, which is similar, has larger oospores and differs in several other points. E. J. Butler described oospores belonging to a form identified by him as *Pythium gracile* [An Account of the Genus *Pythium*. Calcutta, 1907], but their size is somewhat larger (13-24 μ).—A. Jacewski.

1997. Воронихинъ, Н. Н. [WORONICHIN, N. N.] Микологическія замѣтки. I: Нѣкоторые результаты микологическихъ изслѣдованій въ районѣ Воржомъ-леревалъ Цхра Цхаро. [Mycological notes. I. Some results of mycological researches in the region Borjome-Tskhratskharo.] Извѣстія Кавказскаго Музея Тифлисъ [Bull. Caucasian Mus. Tiflis] 12: 1918.—The author enumerates and describes 25 fungi from different groups, mostly Imperfecti, collected in the alpine and subalpine region near Borjom in the summer of 1916. The majority are rather common species, but some are new for Russia, namely: *Septoria bulgarica* Bub. & Malk., previously known only in Bulgaria on *Cirsium appendiculatum* and found here on *Cirsium obvallatum*; *Septoria Daniloï* Bubak, described from Montenegro on *Geranium lucidum* and found here on *Geranium pallens* with larger stylospores (72-82 \times 2 μ) and pycnidia (170-187 \times 155-187 μ); *Septoria Pyrethri* Bres. & Krieger, known from Germany on *Pyrethrum Parthenium* and discovered here on *Pyrethrum macrophyllum*.—A. Jacewski.

1998. Воронихинъ, Н. Н. [WORONICHIN, N. N.] Новые виды грибовъ съ Кавказа. [New or little known fungi from the Caucasus.] Ботаническіе Матеріалы Института Споровыхъ Раствнй Главнаго Ботаническаго Сада. [Notulae Systematicae Inst. Crypt. Hort. Bot. Petropolitani] 1: 33. 1922.—Latin diagnoses are given of 4 new fungi collected in Transcaucasia. One species, *Elenkinella mirabilis*, represents a new genus belonging to the family Englerulaceae, typical tropical forms characterized by the dehiscence of the perithecia. This new genus is chiefly differentiated from others of the same family by the tri-septate, hyaline spores. The species is peculiar in its habitat, being found in the glands of the leaves of *Verbascum pyramidatum*. The other new species described by the author are rusts: *Puccinia Coronillae* (teleutospores on *Coronilla cappadocica*), *Aecidium Coronillae* (on the same host and associated with the former), *Aecidium Willemetiae* (on leaves of *Willemetia tuberosa*, differing from the aecial stage of *Puccinia Willemetiae* Bubak in the structure of the pseudo-peridia and the difference in size of the spores).—A. Jacewski.

1999. Вороновъ, Ю. Н. [WORONOV, G. N.] Сводъ свѣдѣній о микофлорѣ Кавказа. Часть I. Списокъ грибовъ по сихъ лорѣ извѣстныхъ для Кавказа. Юревъ. [Bibliographical index to the Caucasian fungus flora. Part I. Description of Caucasian fungi now known.] 200 p. Yuriev, 1915.—During the last 25 years the Caucasus has been thoroughly investigated by a number of able mycologists (Speschnov, Woronichin, Siemaschko, Woronov, and others) and their studies have been published in a great many different papers. Therefore an index

has been necessary and will be of great aid in further work. The index is similar to the Bibliographical Index of North American Fungi begun by W. G. Farlow, but instead of the alphabetical arrangement the classification of Engler und Prantl in *Die Pflanzenfamilien* has been followed. In this 1st part there are enumerated 445 genera with 1734 [since 1915 this number has considerably increased, and one of our best mycologists, living now in Tiflis, N. N. Woronichin, estimates in 1920 the approximate number of Caucasian fungi equal to 3000, nearly 50 per cent of the whole Russian mycological flora.—*Collaborator's Note.*] species found in Caucasus (inclusive of the Fungi Imperfecti). This is a rather large number considering the fact that for all of Russia the actually known species are estimated at approximately 6000 (inclusive of the Myxomycetes and Fungi Imperfecti) in 878 genera. This rather large number is explained by the great climatic differences present. In the alpine region of the Caucasian chain northern and subpolar species are found, while near the Black Sea, at Suchum and Batum it is not rare to detect typical subtropical forms (*Pseudocolus*, *Asterina*). The 2nd part of this work will contain a bibliographical catalogue. It is intended also to give a list of the herbaria in which Caucasian fungi are to be found, a complete list of the collectors, an alphabetical list of the fungi and of the different hosts, and a history of Caucasian mycology.—A. Jacewski.

2000. ZELLER, S. M. Morphological differences between *Nectria galligena* Bres. and *N. coccinea* (ditissima). [Abstract.] *Phytopathology* 12: 442. 1922.

LICHENS

2001. BATTEN, LILY. Note on the occurrence of *Arthopyrenia foveolata* at Plymouth. *Jour. Marine Biol. Assoc. United Kingdom* 12: 557. 1921.—*Arthopyrenia foveolata* is a crustaceous calcareous lichen occurring at Plymouth, England, in large patches on rocks both above and below the high-water mark and also on limpets and barnacles. It was first found on the coast of Yorkshire in 1901 and has since been collected at various places on the coast of Ireland. The algal element is filamentous and yellowish and belongs to the genus *Trentepohlia*. The perithecia are minute.—*Marshall A. Howe.*

2002. FINK, BRUCE. Lichens. [Rev. SMITH, ANNIE L. Lichens. xxvii + 404 p., 165 fig. Cambridge Univ. Press: England. 1921 (see Bot. Absts. 11, Entry 3459).] *Bot. Gaz.* 74: 115-117. 1922.—Though recognizing many valuable features of the work, the reviewer finds it necessary to object vigorously to the maintenance in it of the old idea that "lichens are not plants, but yet in some mysterious way are plants." He believes it to be very unfortunate that the author could not have followed the modern and logical interpretation that lichens are fungi using algae as hosts. [See also Bot. Absts. 10, Entry 629; 11, Entries 2748, 2749, 3424].—*B. W. Wells.*

2003. HÖEG, OVE. Die norwegischen *Nephroma*-Arten. [The Norwegian species of *Nephroma*.] *Nyt Mag. Naturvidenskab.* 60: 85-97. Pl. 1, fig. 1-3. 1922.—A key to the Norwegian species of *Nephroma* and a survey of their occurrence and distribution are given. Five species belong to the Norwegian flora.—The anatomical features of the genus are described. The "papillae" on the under side of *N. resupinatum* are always present in this species, but never in the other European species of the genus. The anatomy presents considerable similarity to the cyphellae in *Sticta*, and the physiological function must also be the same, corresponding to the stomata of the higher plants.—The tomentum on the under side of the thallus is composed of branched hairs, from which curious spherical cells are set free. The pycnids in all species are described, located on the under side of the thallus in *Nephroma expallidum*.—*K. Münster Ström.*

2004. MELLOR, ETHEL. Les lichens vitricoles et la détérioration des vitraux d'église. [Lichens on glass and the deterioration of church windows.] *Rev. Gen. Bot.* 34: 280-285, 336-345. 1922.—The flora of glassware is usually made up of crustaceous lichens which exist for the most part on the exterior surface; a notable exception is *Biatorina erysiboides*,

which exists only on the interior surface. The factors influencing the vitricolous lichens in their selection are: (1) the surface of the glass, whether it be smooth and shining or corroded; (2) such agents as wind, rain, and sun; (3) the number of species which grow in the neighborhood; (4) diffuse light and tainted air. *Caloplaca vitricola* with its variety *violacea* is described as new. The study on corrosion of glass furnished the following conclusions: (a) The immediate cause of corrosion is the mechanical action exerted by the vitricolous lichens on the surface of glass altered chemically; (b) the chemical alteration of glass is accelerated by the presence of vitricolous lichens; (c) the glass colored yellow by silver resists corrosion for a long time; (d) an annual cleaning of the glass is sufficient to protect it against the invasion of vitricolous lichens, for the germination of spores and growth of thalli is very slow. In addition, the mechanical action on glass is at a minimum during the first months of development. The lead frame should be kept in a good state of preservation.—The action of lichens on rocks particularly slate and feldspar was also studied. The action was found to be much the same as on glass. By increasing the rapidity of weathering the lichens play an important role in the beginning of the change from rock to soil.—*J. C. Gilman.*

BACTERIA

2005. DUFRÉNOY, J., et R. MOLINERY. Resultats de recherches d'hydrobiologie thermale poursuivies à Baresges et à Luchon. [Results of investigations of the biology of thermal springs in Baresges and Luchon.] Jour. Med. Bordeaux. 1922.—Three physiological groups of microorganisms are considered: (1) those which secrete pectic zooglaeae forming "Barégine" deposits; (2) Thiobacteriaceae, chiefly *Thiothrix*; (3) Ferrobacteriaceae, *Clonothrix*, *Leptothrix*, and *Sederocapsa*.—*J. Dufrénoy.*

2006. JENNISON, H. M. Potato blackleg with special reference to the etiological agent. [Abstract.] Phytopathology 12: 444. 1922.

2007. LÖHNIS, F. Studies upon the life cycles of the bacteria. I. Review of the literature 1838-1918. Mem. Nation. Acad. Sci. [U.S.A.] 16^o: 1-335. Pl. A-S, 1-23. 1921.—In the light of the results obtained by the author and N. R. Smith in studies of the *Azotobacter* group it was thought advisable to review all the important literature in the hope of finding further confirmation of amorphous or symplasmic stages and different types of regeneration of bacteria. Though the author feels that the existing classification does not truly express natural relationships, it is followed for convenience. The review of the literature, which is discussed more from a morphological than from a physiological standpoint, is divided into these headings: (1) different cell forms; (2) reproductive organs (gonidia, regenerative bodies, spores, microcysts); (3) formation of symplasm and regeneration of cells; (4) conjunction; (5) methods. A bibliography of 133 pages is given.—*Roxana Stinchfield Ferris.*

PALEOBOTANY AND EVOLUTIONARY HISTORY

E. W. BERRY, *Editor*

(See also in this issue Entries 1817, 2125, 2126, 2206)

2008. ANONYMOUS. A forest under the city of Washington. Science 56: 529-530. 1922.—An excavation disclosed a layer of black swamp muck containing large quantities of well preserved tree trunks and large stumps. The trees were bald cypress and lived in the latter part of the Great Ice Age.—*C. J. Lyon.*

2009. ANONYMOUS. The Devonian forest at Gilboa, N. Y. Science 56: 565. 1922.—Work of excavation by the New York Board of Water Supply at Gilboa, New York, has brought to light many large specimens of the earliest known trees. These trees, though known for many years, have heretofore disclosed no definite relationships. WINIFRED GOLDRING finds evidence of their being seed ferns (*Pteridospermophyta*) much like *Lyginopteris* but simpler in organization.—*C. J. Lyon.*

2010. CARPENTIER, ALFRED. Sur les conifères et les fougères du Wealdien de Féron-Glageon. [On the conifers and ferns of the Wealdian of Féron-Glageon.] Compt. Rend. Acad. Sci. Paris 174: 1121-1124. 1922.—The Wealden flora of northern France contains numerous traces of conifers, ferns, cycadophytes, and Ginkgoales. Descriptions of a number of conifers and ferns are given.—C. H. Farr.

2011. FENTON, CARROLL LANE. The Hackberry stage of the upper Devonian. Amer. Midland Nat. 6: 179-199. Pl. 1, fig. 2. 1920.—The locality of the formation described in the paper is Hackberry Grove Clay Bank in section 35, Portland Township, Cerro Gordo County, Iowa. The author lists the fossils (mainly animal) in each of 3 divisions of the formation. The plant forms are classified as "fucoids" of which "at least two species" are found in the Owen substage, "three or more" in the Spirifer zone, and "several species" in the Striatula zone. None of these plant species are described or named by the author.—Sister M. Ellen.

2012. FLORIN, R. On the geological history of the *Sciadopitineae*. Sverg. Bot. Tidskr. 162: 260-270. Fig. 2. 1922.—*Sciadopitys*, represented in the existing flora by a single Japanese species, is regarded as an old type. The author finds that the linear leaves with a median furrow, in which the stomata occur and in which the epidermal cell arrangement is less distinctly seriate, afford distinctive features readily recognizable in microscopic preparations of fossil cuticular material. He considers that *S. tertiaria* Menzel, from the German Tertiary, is close to the existing species, and that the fossil genus *Sciadopitytes* of Goeppert is also related to it. To *Sciadopitytes* he refers several species from Greenland which Heer described as *Pinus*, and describes the following new species: *S. Hallei*, *S. scotica*, *S. macrophylla*, and *S. scanica*. In all 12 species of *Sciadopitytes*, ranging in age from Rhaetic to Upper Cretaceous, are enumerated. A fuller discussion is promised in a future publication.—E. W. Berry.

2013. FLORIN, R. Über das Vorkommen von *Sciadopitys* im deutschen Tertiär. [On the occurrence of *Sciadopitys* in the German Tertiary.] Senckenbergia 4: 1-5. Pl. 1. 1922.—The author describes the epidermal characters of specimens from the upper Pliocene of Klärbecken, Frankfurt, and concludes that they represent *Sciadopitys* and are identical with the lower Miocene species *S. tertiaria* Menzel.—E. W. Berry.

2014. FRENTZEN, K. Die Keuperflora Badens. [The Keuper flora of Baden.] Verh. Naturw. Ver. Karlsruhe 28: 1-76. Pl. 1-4. 1919.—This is a revision of the Keuper or upper Triassic flora of this classic region of southwestern Germany; 28 species are described. These include 3 Arthrophytes of the genera *Equisetites* and *Neocalamites*; 12 ferns of the genera *Anotopteris*, *Pecopteris*, *Sphenopteris*, *Gleichenites*, *Clathropteris*, *Dictyophyllum*, *Chiropteris*, and *Danaeopsis*; 7 Cycadophytes of the genera *Pterophyllum*, *Dioonites*, and *Otozamites*; 2 Ginkgoales of the genus *Baiera*; 2 Coniferophytes of the genera *Voltzia* and *Widdringtonites*; coniferous wood and the uncertain genus *Schizostachyum*, possibly representing the cones of *Neocalamites*.—E. W. Berry.

2015. JOHNSON, T., and J. G. GILMORE. *Libocedrus* and its cone in the Irish Tertiary. Sci. Proc. Roy. Dublin Soc. 17: 66-70. Pl. 4. 1922.—*Libocedrus salicornioides* (Unger) from the bore at Washing Bay, and from the Interbasaltic at Ballypalady, Ireland, is described.—E. W. Berry.

2016. JOHNSON, T., and J. G. GILMORE. The lignite of Washing Bay, Co. Tyrone. Sci. Proc. Roy. Dublin Soc. 17: 59-65. Pl. 3. 1922.—Microscopic study of material from a deep boring shows it to represent the species *Sequoia Couttsiae* Heer, a widespread Tertiary conifer. Much of interest in the comparative anatomy of *Sequoia*, *Athrotaxis*, *Taiwania*, *Taxodioxylen*, *Taxodium*, and *Cupressinoxylon* comes out of the discussion.—E. W. Berry.

2017. KRÄUSEL, R. Beiträge zur Kenntnis der Kreideflora I. Über einige Kreidepflanzen von Swalmen (Niederlande). [Contributions to knowledge of the Cretaceous flora I. On Cretaceous plants from Swalmen, Holland.] Mededeel. s' Rijks Geol. Dienst A2:

1-40. *Pl. 1-5.* 1922.—The following are identified from between 642-659 m. in a deep bore at Swalmen, Holland: *Didymosaurus comptoniaefolius*, *Araucaria crassifolia*, *Elatocladus elegans*, *Moriconia cyclotoxon*, *Sequoia reichenbachii*, *S. sp.*, *Myrica cretacea*, *M. longifolia* (?), and *M. pseudoquercifolia*, the last being described as new. The epidermal characters of a number of these are described and it is concluded that the geological horizon is the same as the Upper Cretaceous Aachen (Aix-la-Chapelle) sands.—*E. W. Berry.*

2018. SCOTT, D. H. The present position of the theory of descent, in relation to the early history of plants. Rept. British Assoc. Adv. Sci. 1921: 170-186. 1921.—[See Bot. Absts. 11, Entries 502, 521.]

2019. THOMAS, H. H. On a new group of angiospermous fruits from the Middle Jurassic of Yorkshire. [Abstract.] Rept. British Assoc. Adv. Sci. 1921: 452. 1921.

2020. WEBSTER, CLEMENT L. Observations on some marine plants of the Iowa Devonian, with descriptions of new genera and species. Amer. Midland Nat. 6: 286-289. 1920.—Six new species, 5 of which are included in 3 new genera of the upper Devonian or Hackberry group at Bloody Run in Floyd County, Iowa, are described as follows: *Zearamosus elleria* n. gen., n. sp.; *Gracilirectus Hackberryensis* n. gen., n. sp.; *Fruticristatum iowense* n. gen., n. sp., and the new forms *moraense* and *pervetus*; *Buthotrephis thomasia* n. sp.—*Sister M. Ellen.*

PATHOLOGY

FREDERICK V. RAND, *Editor*

LILLIAN C. CASH, *Assistant Editor*

(See also in this issue Entries 1537, 1538, 1552, 1558, 1559, 1560, 1601, 1623, 1641, 1662, 1668, 1685, 1689, 1693, 1700, 1702, 1703, 1713, 1715, 1728, 1753, 1789, 1827, 1835, 1837, 1841, 1852, 1856, 1860, 1865, 1880, 1883, 1889, 1894, 1951, 1953, 1957, 1959, 1961, 1965, 1966, 1971, 1972, 1973, 1981, 1985, 1992, 1993, 1995, 2006, 2107, 2127, 2129, 2142, 2149, 2150)

DISEASES CAUSED BY FUNGI

2021. B[ERNARD, CH.] Djamoer oepas op Sesbania. [Poison fungus on Sesbania.] De Thee 1: 44-45. 1920.—*Djamoer oepas* (*Corticium Javanicum*) attacks *Sesbania* as it does many legumes under favorable circumstances. A crust of *Capnodium*, growing in the sweet excrement of a cicada (*Lawana*), provided a moist cover which favored the development of the *Corticium* in the serious attack observed.—*Carl Hartley.*

2022. BERNARD, CH., en A. KEUCHENIUS. Bestrijding van wortelziekten. [Control of root diseases.] De Thee 1: 35-41. 1920.—This is a preliminary report of tests with soil disinfectants and amendments against the "split-canker" fungus (*Armillaria*) and the red root fungus (*Poria*) of tea. Plants in the earliest stages of disease were treated. The amounts of the different substances added were, per plant, 8½ l. of 1 per cent carbolic acid; 1½ l. of 10 per cent carbolineum; 8½ l. of wood ashes + an equal quantity of water containing 30 cc. carbolic acid; and air-slaked lime. The carbolic acid treatment proved useless; lime and carbolineum seemed to have some value; ashes with carbolic acid proved disappointing. On another estate the application of 3 and 9 kgm. wood ashes per plant, the former on a large scale, indicated value. In a 3rd locality lime treatment was followed by improvement, and parallel ammonium sulphate treatment by an increase in disease. The tests will be continued. Crude inoculation with *Armillaria* by placing diseased roots and stumps in the soil was successful.—*Carl Hartley.*

2023. CIFERRI, R. Una rara malattia delle foglie del susino. [A rare disease of plum foliage.] Riv. Patol. Veg. 12: 59-64. 1922.—A rare affection of leaves of plum, variety Luther Burbank, was found to be due to a fungus morphologically identical with *Microstroma*

Tonellium Ferraris. The spores are borne on basidia-like conidiophores crowded closely together inside the epidermis on the under side of the leaf. A part of the literature on the systematic position of the genus *Microstroma* is reviewed.—*F. M. Blodgett*.

2024. DIETRICH, F. O. Über die Erkrankung der Kartoffeln. [Disease in potatoes.] Mitteil. Deutsch. Landw. Ges. 37: 614-616. 1922.—The author discusses the effect of drought and other meteorological conditions on potato diseases and on the yield in Germany, giving especial attention to potato wart. The selection of healthy plants and wide spacing are advised.—*Lillian C. Cash*.

2025. FULTON, H. R. Occurrence of *Thielaviopsis paradoxa* on the cocoanut palm in Florida. Phytopathology 12: 398-399. 1922.—*Thielaviopsis paradoxa* (De Seyne) v. Höhn. was found causing a decay in the trunk of a cocoanut palm (*Cocos nucifera*).—*B. B. Higgins*.

2026. GARRETSSEN, A. J. Roetdauw. [Sooty mold.] De Thee 2: 56-57. 1921.—*Hor-miscium* sp. developed strongly on tea in Java in the honey-dew exuded by *Tachardia* sp. Leaf function was interfered with; and in some cases partial defoliation resulted. Brushing the branches is recommended.—*Carl Hartley*.

2027. HALL, C. J. J. VAN. Voorloopige mededeeling over de wortelschimmels van de thee. [Preliminary account of the root diseases of tea.] Dept. Landb. Nijv. en Handel [Nederland.-Indië] Proefsta. Thee Mededeel. 58. 26-27. 1918.—Seven kinds of root diseases are briefly considered and ascribed to the following fungi: *Rosellinia (bothrina?)*, *R. (bunodes?)*, *R. sp.*, *Ustilina zonata*, *Poria hypolateritia*, *Hymenochaete noxia*, and *Armillaria?*.—*R. D. Rands*.

2028. HEMMI, TAKEWO. On the occurrence of *Mycosphaerella* wilt of muskmelons in Japan. Phytopathology 12: 394-397. 1922.—The occurrence in Japan of *Mycosphaerella citrullina* (Smith) Gross on muskmelon, cucumber, and on a kind of gourd (*Lagenaria vulgaris* var. *gourda* Ser.) is reported.—*B. B. Higgins*.

2029. HURSH, C. R. The relation of temperature and hydrogen-ion concentration to urediniospore germination of biologic forms of stem rust of wheat. Phytopathology 12: 353-361. Fig. 1-7. 1922.—Two biologic forms of *Puccinia graminis*, differing markedly in their ability to parasitize certain varieties of wheat, were selected for this study. The percentage germination of the urediniospores of the 2 forms was compared in solutions of various H-ion concentration and at temperatures of 10, 20, and 30°C. One form was decidedly more tolerant than the other to variations in temperature and H-ion concentration, showing that biologic forms may be demonstrated by specific physiological reactions. Tolerance to variations in temperature and in H-ion concentration was, in this instance, associated with a wider range of hosts.—*B. B. Higgins*.

2030. PELTIER, GEORGE L. A study of the environmental conditions influencing the development of stem rust in the absence of an alternate host. 1. The viability of the urediniospores of *Puccinia graminis* *Tritici* form III. Nebraska Agric. Exp. Sta. Res. Bull. 22. 15 p., 3 fig. 1922.—The author reports experiments on the viability of urediniospores of stem rust of wheat under controlled conditions. A series of temperatures were used ranging from 5 to 30°C., at 5° intervals. The spores were submitted at each temperature to relative humidities ranging from 0 to 100 per cent at approximately 10 per cent intervals. The viability of the spores was determined by germination tests in the laboratory and by infection tests in the greenhouse. The conclusions reached are: (1) The influence of relative humidity on the viability of the urediniospores of *Puccinia graminis* *Tritici* form III is very pronounced and closely associated with temperature; (2) at high relative humidities, depending somewhat on the temperature, the percentage of germination is low and the period over which the spores are viable is very short; (3) the same relation exists at the low relative humidities except that it is not so pronounced and is more variable; (4) the highest percentage of germination and

the longest viable period of the spores occur at the medium relative humidities. At the medium relative humidities high temperatures lower the percentage of germination and shorten the viable period while at low temperatures the opposite occurs.—*T. A. Kiesselbach.*

2031. SIGGERS, PAUL V. *Torula ligniperda* (Willk.) Sacc., a hyphomycete occurring in wood tissue. *Phytopathology* 12: 369-374. *Pl.* 25. 1922.—In testing the strength of blocks, using shipments of yellow poplar (*Liriodendron tulipifera* L.) and white ash (*Fraxinus americana* L.), the strength values varied considerably although the wood appeared sound. Microscopic examination showed that hyphae and spores of a fungus, later identified as *Torula ligniperda* (Willk.) Sacc., were present in the lumen of the cells. The fungus was isolated from the poplar wood, and its effect on sterile blocks of several species was studied.—*B. B. Higgins.*

2032. STONE, R. E. Leaf scorch or Mollisiose of the strawberry. *Phytopathology* 12: 375-380. *Fig.* 1-3. 1922.—The symptoms and etiology of the disease and the relative susceptibility of strawberry varieties are discussed. The disease appears in the early spring as small, irregular, purple blotches on the leaves and as purple streaks on the leaf petioles and flower peduncles. The blotches enlarge rapidly, and their centers die and turn gray. As the blotches enlarge they coalesce until by mid-summer the entire leaf is frequently involved and killed. On the dead spots the acervuli of a fungus identified as *Marsonia Potentillae* (Desm.) Fischer were found. The following spring ascocarps of *Mollisia earliana* (E. & E.) Sacc. were found on the dead leaves. Cultures obtained from single ascospores of this fungus produced conidia of the Marsonia type. Strawberry plants inoculated with conidia from these cultures developed typical leaf scorch symptoms, indicating the genetic connection of the 2 spore forms.—*B. B. Higgins.*

2033. STOUTAMIRE, RALPH. What makes the orange mushy? *Florida Grower* 28¹³: 4-5. 1922.—This is a popular description of the softening influence of stem-end rot (*Phomopsis Citri*) upon orange fruit.—*J. C. Th. Uphof.*

2034. WILTSHIRE, S. P. A disease of Michaelmas daisies. *Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta.* 1920: 84-85. 1920.—A disease which the author thinks is caused by a fungus of the *Fusarium* type causes a yellowing of the bottom leaves, checking of growth, sometimes premature flowering, and earlier dying of individual shoots. "A fungus has been isolated from the diseased tissues, and preliminary inoculation experiments indicate that it is the cause of the disease." The fungus grows in the conductive tissue and thus stops the water supply. No control method is recommended except marking diseased plants in order to avoid propagating from them, and burning of infected material.—*W. H. Chandler.*

2035. WILTSHIRE, S. P. The bark canker disease of apples. *Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta.* 1920: 81. 1920.—Cankers on the main branches of apple trees caused by *Myzosporeum corticolum* Edgerton were found in the orchards at Long Ashton. The injury seemed to be slightly worse than that reported in the U. S. A.—*W. H. Chandler.*

2036. WILTSHIRE, S. P., and G. T. SPINKS. Apple tree canker. *Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta.* 1920: 82-83. 1920.—This is a discussion of the infection of young apple buds by *Nectria ditissima*. Cracks in the leaf-scar tissue seem to be a means of entrance for the fungus. As long as the leaves remained on the tree no autumn infection occurred. Spraying seemed to reduce the number of cankers formed. A more complete report is promised.—*W. H. Chandler.*

DISEASES CAUSED BY BACTERIA

2037. GOSSARD, H. A., and R. C. WALTON. Dissemination of fire blight. *Ohio Agric. Exp. Sta. Bull.* 357. 81-126, *fig.* 1-13 + 3 *fig.* unnumbered. 1922.—This bulletin comprises a report of a series of studies on fire blight dissemination conducted by the junior author in

cooperation with the department of entomology. It was found that *Bacillus amylovorus* may live in honey for 72 hours or more. Infections were obtained by the use of honey taken from 3 hives, by the use of apple pollen removed from the baskets of bees caught as they were entering the hive, and by inserting the mouth parts of bees into incisions made in tender twigs. The fire blight organism was found to be alive in aphid honey-dew after 7 full days, and to survive in peach, plum, and cherry nectar for 5 days. Rain was proved to be the most important factor in the dissemination of infection over a tree after centers are established, and especially if the latter are near the top. It was estimated that 50-90 per cent of blossom infection was accomplished by infected rain water. Seventy-two hours after pollination, blossoms are only slightly susceptible to infection, and after 144 hours they are practically immune. Several sucking and boring insects were observed to be carriers of fire blight. All experiments with ants were negative. The authors suggest that there is ample ground for crediting blossom fire blight with traveling northward with the zone of inflorescence to a greater extent than is now accepted. The fire blight organism was not found to be sensitive to the electric violet ray.—*R. C. Thomas.*

2038. GROENEWEGE, J. Landbouwkundige onderzoeken over de slijmziekte. [Agricultural investigations of slime disease.] Dept. Landb. Nijv. en Handel [Nederland.-Indië] Alg. Proefsta. Landb. Mededeel. 12. 79 p., 16 pl. 1922.—The peanut (*Arachis hypogaea*), even with wounded roots, may remain healthy in soil or water cultures containing the causal organism (*Bacterium Solanacearum*) of this disease. This bacterium is believed to be a normal constituent of the soil flora, and the incidence of the disease which it causes is dependant on environmental conditions favoring the susceptibility of the host. Susceptibility of peanut and tobacco is due to lack of soil oxygen. When diseased plants are found in soils in good general tilth the roots are seen to be decayed at and below points where they pass through clods. These clods exhibit an internal blue color due to imperfectly oxidized iron compounds. Death of the root at such a point is directly due to oxygen hunger; the bacteria subsequently use the lesion as an infection port. In pot experiments, 61 per cent of the plants growing in paraffined pots wilted, while in ordinary unglazed pots only 18 per cent showed disease symptoms. The rapid loss of virulence of *B. Solanacearum* in artificial cultures reported by other investigators was not observed. Honing's failure to secure infection with strains long in cultivation was due to the use as inoculum of subcultures which were 1-2 weeks old and therefore dead. The peanut is easily grown in a solution containing 0.1 per cent KNO_3 and 0.05 per cent each of CaSO_4 , MgSO_4 , and $\text{Ca}_3(\text{PO}_4)_2$ with a trace of Fe. In water cultures very young plants infected to the point of wilting, and with bacteria already in the petioles, in some cases recovered. The plants most diseased in water cultures were obtained under the driest atmospheric conditions. In both peanut and tobacco unquestionably infected plants developed new roots which appeared free from bacteria. It is concluded that the bacteria can spread only in the direction of the transpiration stream. The penetration of aerated water into the soil following the root downward is indicated by the finding of orange (therefore ferrie) particles in otherwise blue soils. The presence of fresh organic matter in the soil is thought to increase the amount of disease by exhausting the oxygen supply. Adding sugar to pot cultures at the rate of approximately $\frac{1}{4}$ and $\frac{1}{2}$ per cent by weight, resulted in decreased disease. This is explained in connection with the effect of the sugar on the water-holding capacity of the soil. The fact that the disease in tobacco is more serious in north Sumatra than in Mid-Java is attributed to the poorer soil cultivation in the former locality.—*Carl Hartley.*

2039. JARVIS, E. Bureau of sugar experiment stations. Combating sugar cane pests. Cane pests on the Herbert River. Australian Sugar Jour. 14: 413-416. 1922.—The gumming disease (*Bacillus vascularum*) is prevalent throughout the Herbert River district, occurring mostly in Clarke's Seedling (H. Q. 426). The cane variety Badila is already infected and it is feared may become more so. The variety H. Q. 409, although practically immune to the gumming disease, is unpopular here because of its slow growth and tendency to arrow freely and very early. Selection of clean cane, planting of immune varieties, good drainage and cultivation of land, and the use of green manures are advised.—A brief discussion is also given to

the pest-destruction fund, to damage by rats and by white ants, and to a tachinid fly parasite of the cane borer.—*C. Rumbold*.

2040. MARTIN, J. P. Variation in color of pear blight exudate. *Phytopathology* 12: 399-400. 1922.—A dark green color was noted in the first exudate from a single loquat (*Eriobotrya japonica* Lindl.) twig inoculated with *Bacillus amylovorus* (Bur.) De T., while from other twigs inoculated at the same time the exudate had the normal color.—*B. B. Higgins*.

2041. THOMAS, ROY C. A bacterial rosette disease of lettuce. *Ohio Agric. Exp. Sta. Bull.* 359. 197-214, 8 fig. 1922.—A bacterial rosette disease of lettuce found chiefly in greenhouses in Ohio is reported. The disease closely resembles, and is thought to have been previously confused with, the older recognized form of rosette due to *Rhizoctonia*. Inoculation experiments have demonstrated the pathogenicity of the bacterium associated with the disease, and it is thought that the organism can survive indefinitely in the soil. Control experiments have shown that the formaldehyde-drench plan is an effective method of eradication. Steam sterilization is also suggested. Cultural studies of the pathogen have revealed points of similarity and of difference between it and another one causing a similar disease previously reported from South Carolina. The name *Aplanobacter Rhizoctonia* n. sp. is suggested for the Ohio organism.—*R. C. Thomas*.

2042. WILTSHIRE, S. P. A bacterial infection of plum trees. *Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta.* 1920: 78-80. 1920.—Trunks of large plum trees were found to have been killed, the part first killed being about 3½ feet above ground. Bacterial masses were constantly present in the diseased cortex of the many specimens examined, together with fungus hyphae and in many cases *Cytospora* fructifications. “. . . the association of the bacteria with the disease in such a number of cases is extremely suggestive and appears to be more than an accidental occurrence. The relationship between the bacterial organism and the fungus *Cytospora* is only a matter of conjecture. . . .”—*W. H. Chandler*.

DISEASES CAUSED BY ANIMAL PARASITES (INSECTS, NEMAS, PROTOZOANS, ETC.)

2043. INSTITUT INTERNATIONAL D'AGRICULTURE. Enquête sur la lutte contre la mouche des olives (*Dacus oleae*) dans les divers pays. [Investigations on the control of the olive fly.] vi + 89 p. Imprimerie de la Chambre des Députés: Rome, 1922.—This report is an assemblage of various papers from different countries, relating to olive-fly control. Several bibliographies list the principal publications dealing with this insect, and its control and relation to disease transmission.—*Frederick V. Rand*.

2044. SCHLUPP, W. F. The principal orchard pests and how to control them. 29 p., 5 fig. Johannesburg, [192-?].—This is a brief, popular handbook dealing with the insects of the orchard and their control. Following a general introduction, the codling moth, and various fruit flies, aphids, and scale insects are in turn briefly discussed.—*Frederick V. Rand*.

2045. WAHL, BRUNO. Auftreten des Kolorado-Kartoffelkäfers in Südfrankreich. [Appearance of Colorado potato beetle in southern France.] *Oesterr. Zeitschr. Kartoffelbau* 2: 24. 1 fig. 1922.—The area infested is already 250 square km. and constitutes the largest area in Europe into which this potato pest has yet escaped. The warm climate of France is thought likely to be conducive to its further spread.—*F. Weiss*.

INFECTIOUS CHLOROSIS (MOSAIC AND PEACH YELLOWS GROUPS, ETC.)

2046. BRUNER, STEPHEN C. Bibliographia. La enfermedad de las “rayas amarillas” en la caña. [Bibliography. The yellow stripe disease of sugar cane.] *Rev. Agric. Com. y Trab. Cuba* 5: 32-33. 1922.—This is a critical review of MOISES SIMONETTO's *La Enfermedad de las Rayas Amarillas en la Caña* (Su Importación y Extension—Año y Medio de Observaciones en Cuba) [see *Bot. Absts.* 11, Entry 1776].—*G. R. Hoerner*.

2047. GARDNER, MAX W., and JAMES B. KENDRICK. Overwintering of tomato mosaic. Bot. Gaz. 73: 469-485. Pl. 17. 1922.—The authors find no evidence for the transmission of mosaic by way of the seed. They were successful in proving that the inoculum may overwinter in perennial herbs. Various species of the genus *Physalis* are important in this respect. Mosaic was found affecting *Physalis subglabrata*, *P. virginiana*, *P. heterophylla*, and *Solanum carolinense*. Evidence was obtained that the disease had spread to *Physalis* plants 200-400 feet away from infected tomato fields. Aphids and flea beetles are believed to play a part in the transmission to *Physalis* plants. The eradication of solanaceous perennial herbs in and near tomato fields is recommended as a control measure.—B. W. Wells.

PARASITIC PHANEROGAMS

2048. HERBERT, D. A. The parasitism of *Olax imbricata*. Philippine Agric. 11: 17-18. 1 fig. 1922.—*Olax imbricata* Blume (Malabaguio), a large woody vine with well developed leaves and a shallow and wide root system, occurs sparingly in Mount Makiling. Its large, rather soft roots branch and ultimately give rise to fragile white rootlets, which in contact with other roots produce a lateral haustorium of the same type as that found in the Santalaceae. Haustoria attached to a host root derive salts and water, as well as organic matter, from the host plant. Two of the 3 host plants observed were legumes. Self parasitism is common, and the best development of haustoria was found on roots of *Olax* itself.—Sam F. Trelease.

NON-PARASITIC DISEASES

2049. DEUSS, J. J. B. Kloetasch in theetuinien. [Ash from the Kloet in tea gardens.] De Thee 1: 67-68. 1920.—The eruption of the Kloet in East Java resulted in the deposition of an ash layer 5-20 cm. thick in a tea plantation. Defoliation and death of young plants followed. As a result of previous experience in this locality the ashes were worked into the upper soil as thoroughly as possible in order to prevent cementing into an impervious layer. The working in of as much organic matter as possible was also advised. On other plantations where the layer was only 1-1½ cm. deep it was turned under without injury to the plants.—Carl Hartley.

2050. FABRICIUS. [Rev. of: GRAEBNER, PAUL. Handbuch der Pflanzenkrankheiten begründet von Paul Sorauer. Vol. I. Die nichtparasitären Krankheiten. (Non-parasitic plant diseases.) 4th ed., 959 p., 264 fig. Paul Parey: Berlin, 1921 (see following entry).] Forstwiss. Centralbl. 44: 34-37. 1922.—This work is based on the theory that the chief causes of disease or weakness in plants, including susceptibility to parasitic diseases, are to be found in climatic, soil, or cultural conditions, and that the most effective means of combating the diseases are development of resistant forms and proper plant sanitation. The book does not overlook forestry and tree diseases, as so many books on plants do, but contains much of direct interest to foresters. It does omit some tree ailments, such as sun-scald.—W. N. Sparhawk.

2051. GRAEBNER, PAUL. Handbuch der Pflanzenkrankheiten begründet von Paul Sorauer. Vol. I. Die nichtparasitären Krankheiten. [Handbook of plant diseases founded by Paul Sorauer. 1. The non-parasitic diseases.] 4th ed., xv + 959 p., 264 fig. Paul Parey: Berlin, 1921.—This work constitutes a completely rewritten edition of volume 1 of SORAUER'S Handbuch. In the words of Graebner, "The literature of this previously neglected and at the same time economically important subject had become so enormously increased that it was necessary to introduce extensive supplementary studies in spite of the fact that I had presented the non-parasitic diseases as a teacher for almost a quarter of a century. All using the third edition will recall how exceedingly difficult it is to find one's way through the complex subject matter. Therefore, so far as possible in adapting the present edition to the classification of Sorauer, I have undertaken a sharp delimitation of the sections and chapters in order to facilitate an understanding of the subject by the student and a rapid orientation by the specialist. As far as possible numerous references have been added as footnotes.—A number of new figures, especially photographic reproductions, have been included. To my

regret I have not succeeded in complying with the wish of the publisher to reduce the size of the work. On the contrary, through numerous supplementary additions, appearing especially in the corrections, it is even enlarged."—Under the general part of the work 3 sections deal respectively with historical phases of the subject, the nature of disease, and growth changes due to different geographical situation. In the 2nd part the special phases of the subject are exhaustively discussed under the following sections: (1) diseases caused by unfavorable soil conditions; (2) the influence of humidity, dryness, and movements of the air; (3) effects of heat and light; (4) wounds; (5) diseases caused by injurious gases and liquids; (6) the diseases exhibiting abnormal enzymatic functions under which are included the mosaic, sereh, and yellows groups, and several gummoses and resinoses.—This work is not to be confused with the *Lehrbuch der Nichtparasitären Pflanzen Krankheiten* [see Bot. Absts. 9, Entry 418], which is a concise textbook intended especially for students. [See also preceding entry.]—*Frederick V. Rand.*

2052. LA RUE, CARL D. **Lightning injury to *Hevea brasiliensis*.** *Phytopathology* 12: 386-389. 1922.—In the type of injury here discussed the current of electricity seems to pass principally through the cambium and young sap wood without external injury, such as tearing of the bark or branches. Usually one or more trees are killed and the surrounding trees more or less severely injured. The injury is most severe just back of the tip of a branch. When the injury is slight only the tips of the branches die. Death of the tissue is followed almost immediately with infection by *Diplodia*. Lightning injury to *Hevea* is, therefore, frequently diagnosed as "die back."—*B. B. Higgins.*

2053. SNELL, WALTER H., and NATHANIEL O. HOWARD. **Notes on chemical injuries to the eastern white pine (*Pinus Strobus* L.).** *Phytopathology* 12: 362-368. *Pl. 24, fig 1-2.* 1922.—Two instances of chemical injury to white pine trees are recorded. In one case the trees in an area approximately $\frac{1}{2} \times \frac{1}{4}$ mile in extent, adjacent to a brick kiln, were seriously injured, apparently by fumes from soft coal burned in the kiln. The leaves were reddish brown and from a distance appeared to be entirely dead; but close examination showed that the bases of many leaves were still green. Leaves of several broad-leaved species also showed injury. In the other case white pine trees were killed or severely injured by calcium chloride dissolved from metal containers which stood under the trees about a month.—*B. B. Higgins.*

DISEASES OF UNKNOWN CAUSE

2054. LEES, A. H. **A method of identifying reversion of black currants.** *Univ. Bristol Ann. Rept. Agric. and Hort. Res. Sta.* 1920: 66-70. *Pl. 4.* 1920.—Suggestions are given as to methods of identification and control of this disease. [See also Bot. Absts. 9, Entry 403; 11, Entry 4475].—*W. H. Chandler.*

2055. PALMER, W. B. **Pecan rosette.** *Proc. Ann. Convention Nation. Nut Growers' Assoc.* 20: 72-78. 1921.—This is a popular lecture. In the author's opinion water cannot be the main cause of rosette since the disease occurs under such widely varying water relations. After briefly reviewing the parts played by the various elements of plant nutrition and the results of experience in his own orchard, the author states that "Rosette can then be defined as that condition of a tree caused primarily by the lack of available nitrogen in the soil in which the tree grows or the inability of the tree to appropriate the nitrogen."—It is the rich nitrogen supply in the alluvial bottom lands, he says, that prevents rosette on such soils, and this is the deficient element in most soils. Rosette was relieved in his own orchard by heroic applications of nitrogen, but he does not think that the same result would necessarily follow in all orchards.—*Frederick V. Rand.*

2056. RAND, FREDERICK V. **Pecan rosette: its histology, cytology, and relation to other chlorotic diseases.** *U. S. Dept. Agric. Bull.* 1038. 42 p., 12 pl., (1 colored). 1922.—After a brief discussion of different types of plant chloroses a review is given of previously published histological and cytological studies relative to infectious chloroses and to chloroses caused

directly by soil or atmospheric conditions.—The 2nd part of the paper reviews the previous work on pecan rosette and then details the present histological and cytological investigation.—“As a class, the chloroses due to soil or atmospheric conditions are rather general effects which are more or less comparable to starvation, overfeeding, or direct poisoning. . . . In the specific chlorotic diseases of an infectious nature fundamental derangements in both physiological and structural development are simultaneously brought about. . . . The histological and cytological evidence suggests that pecan rosette in its specific sequence of signs and in the complexity of the structural and physiological derangements bears far more similarity to the known infectious chloroses than to those caused by soil or climatic conditions. Whether in this particular disease the factors responsible for alterations in the normal structure and metabolism must be introduced into the plant from without, or whether they originate within the plant itself, is a question yet to be answered; but whatever the ultimate solution of the problem the cause will undoubtedly not be found in any simple soil or water relation.”—A bibliography of 85 titles is appended.—*Frederick V. Rand.*

2057. WEAVER, WALTER. Pecan rosette. Proc. Ann. Convention Nation. Nut Growers' Assoc. 20: 67-72. 1921.—This is a popular lecture in which the author expresses the opinion that pecan rosette is strictly a moisture problem and due to excess of transpiration over intake. In support of this theory he draws the following from his own experience: No improvement after liberal feeding; quick results from manure mulch without appreciable rainfall; improvement under mulch with but little new growth; aggravation of rosette near barnyards with abundant food supply; marked aggravation following drought; appearance of rosette in late summer when the soil water supply is at a minimum and when high temperatures cause the greatest transpiration; and the usual absence of rosette in neglected orchards and near buildings where food is scanty and soil water is more abundant on account of shading, and where the roots are not disturbed or exposed to high temperatures. The rosette formation, indicating an adaptation to reduce transpiration, and the high percentage of pure water present in plants lend further support, he says, to this theory. The main suggestions for control include applications of potash and the use of cover crops.—*Frederick V. Rand.*

GENERAL AND MISCELLANEOUS PATHOLOGICAL LITERATURE

2058. ANONYMOUS. Control of insect pests and diseases of vegetable crops. Ohio Agric. Exp. Sta. Monthly Bull. 7: 89-97. 1922.—Methods which have proved efficient for the control of the most serious vegetable diseases found in Ohio are tabulated. A brief discussion is given of general cultural practices emphasizing sanitation, and brief directions are included for the preparation and use of current fungicides and methods of sterilization.—*R. C. Thomas.*

2059. B[ERNARD, CH.] Wortelziekten en boomstronken. [Root diseases and tree stumps.] De Thee 1: 25-26. 1920.—A planter reports much root disease in tea in the immediate vicinity of stumps of *Celtis cinnamomea*.—*Carl Hartley.*

2060. CHASE, W. W. The principal parasites of the peach. Georgia State Bd. Entomol. Bull. 61. 43 p., 19 fig. 1922.—This revision of bulletins 43 and 57 gives a spray schedule for peaches and discusses various fungus and insect parasites. Special attention is given to the relation of brown rot (*Sclerotinia fructigena* Schröt.) to the curculio. It is shown that a severe infestation of this insect increases the disease, and that there is also a relation between brown rot and excessive growth and moisture. Other parasites discussed are peach scab (*Cladosporium carpophyllum* Thum.), leaf curl (*Exoascus deformans* (B.) Fuckel.), peach tree borer (*Sanninoidea exitiosa* Say), plum curculio (*Conotrachelus nenuphar* Herbst.), San Jose scale (*Aspidiotus perniciosus* Comstock), shot-hole borer (*Scolytus rugulosus* Ratz), and nematode (*Heterodera radiculicola* (Greff.) Mul.).—*T. H. McHatton.*

2061. DEMAREE, J. B. Pecan disease investigations during 1921. Proc. Ann. Convention Nation. Nut Growers' Assoc. 20: 37-39. 1921.—This lantern slide lecture was given to ac-

quaint the growers with the lines of work being done rather than to show the results obtained. Experiments on rosette, scab, and kernel spot are briefly described and the locations given.—*Frederick V. Rand.*

2062. DOIDGE, ETHEL M. **Diseases of the apple, pear and quince.** 50 p., 17 fig. Johannesburg, [1917 ?].—This is a popular handbook briefly discussing the following diseases and their control: bitter rot (*Glomerella cingulata* (Stonem.) S. & S.), black rot (*Sphaeropsis Malorum* Peck), leaf blight (*Fabraea maculata* Atk.), scab (*Venturia inaequalis* Cke., and *V. pirina* Aderh.), powdery mildew (*Podosphaera leucotricha* (E. & E.) Salm.), bitter pit, die-back (*Valsa leucostoma* (Pers.) Fr.), apple cracking disease (*Coniothecium chomatosporium* Corda), crown gall (*Bacterium tumefaciens* Erw. Sm.), cankers (*Glomerella cingulata*, *Phylospora Cydoniae*, *Valsa leucostoma*, *Nectria ditissima* and sun scald). A general section on the prevention of diseases follows.—*Frederick V. Rand.*

2063. DOIDGE, ETHEL M. **Potato disease.** 49 p., 26 fig. Johannesburg, [1920.]—This is a popular handbook briefly discussing the following diseases and their control: early blight or leaf curl (*Macrosporium Solani* E. & E.), scab (*Actinomyces chromogenus* Gasp.), corky or powdery scab (*Spongospora subterranea* (Wallr.) Johns.), black scab canker or wart (*Synchytrium endobioticum* Pers.), bacterial wilt (*Bacterium Solanacearum* Erw. Sm.), Rhizoctonia disease (*Corticium vagum* var. *Solani* Burt.), late blight (*Phytophthora infestans* de By.), and internal brown fleck.—*Frederick V. Rand.*

2064. EZEKIEL, WALTER N. **Photographing tube cultures.** *Phytopathology* 12: 399. 1922.

2065. MANUEL, H. L. **Faulty lime in Bordeaux mixture.** *Agric. Gaz. New South Wales* 33: 759. 1922.—Emphasis is placed on the fact that lime intended for Bordeaux mixtures should not be allowed to become carbonated.—*L. R. Waldron.*

2066. PENZIG, O. **Pflanzen-Teratologie systematisch geordnet.** [Plant teratology.] 2nd ed., much enlarged, Vol. I. xviii + xi + 283 p. 1921; Vol. II. 548 p. 1921; Vol. III. 624 p. Gebrüder Borntraeger: Berlin, 1922.—“Since the appearance more than twenty-five years ago of the first edition of this work, the observational material concerning plant anomalies and monstrosities has increased enormously and is to be found in many hundreds of papers and larger works distributed through the botanical literature of all lands. The time is, therefore, ripe for an exhaustive review of the observed facts gathered by various authors, and of their significance in the morphology and taxonomy of the individual groups discussed.”—Following the prefaces, introduction, and glossary the main part of volume 1 is given up to an alphabetically arranged bibliography. The remainder of the work gives bibliographical references and abstracts of published teratological data arranged according to the taxonomic position of the plants discussed. Volume 2 deals entirely with the dicotyledonous group Polypetalae, while volume 3 takes up the dicotyledonous Gamopetalae, and the monocotyledons, pteridophytes, bryophytes, fungi, lichens, and algae.—*Frederick V. Rand.*

2067. RAMSAY, A. A. **Storage experiments with lime intended for sprays.** *Agric. Gaz. New South Wales* 33: 747-749. 1922.—Fresh lime was slaked and kept under water for 172 days. A series of analyses during this period showed no appreciable diminution of the efficacy of the product.—*L. R. Waldron.*

2068. WRIGHT, HORACE J. **Plant pests and parasites. Preventives and remedies.** 32 p., 1 fig (on cover). “County Life.” London, 1922.—This brief, popular handbook takes up the pests and parasites (and their control) among (1) flowers, (2) fruits, and (3) vegetables. Sections on general enemies, and on useful washes and dressings are appended.—*Frederick V. Rand.*

PHARMACOGNOSY AND PHARMACEUTICAL BOTANY

HEBER W. YOUNGKEN, *Editor*E. N. GATHERCOAL, *Assistant Editor*

(See also in this issue Entries 1631, 1644, 1708, 1822, 1865, 1867, 1887)

2069. ANONYMOUS. Potash from kelp in Australia. Jour. Dept. Agric. Victoria 18: 498. 1920.—The average potash contents of the ash is about 14 per cent. Individual samples have yielded 30 per cent.—*Wm. E. Lawrence.*

2070. CHEEL, EDWIN. Notes on the "scarlet" and "blue" pimpernel. Australian Nat. 5: 18-19. 1922.—*Anagallis arvensis* is poisonous to birds. Some reasons are given for considering *A. arvensis* and *A. coerulea* as distinct species.—*T. C. Frye.*

2071. HASKIN, LESLIE L. The death Camas. Amer. Bot. 28: 141-143. 1922.

2072. HERBERT, D. A. Cyanophoric plants of the Makiling region. Philippine Agric. 11: 11-16. 1922.—By modifications of Guignard's sodium picrate test, 110 species, belonging to 41 families,—including native Philippine species, introduced fodder and food plants, ornamental plants, and weeds,—were tested for the presence of hydrocyanic acid, with the result that 86 species were characterized by its presence. The distribution of hydrocyanic acid in the plant was not uniform, even in species belonging to the same genus; in the majority of cases the greatest amount was in the bark. Nor was the acid always present in a given species.—*Sam F. Trelease.*

2073. KING, HAROLD. The isolation of muscarine, the potent principle of *Amanita muscaria*. Jour. Chem. Soc. [London] 121: 1743-1753. 1922.—Details are given of a method of isolating pure muscarine from fresh *A. muscaria* tissue. The distribution of muscarine in the various fractions obtained was determined by 2 methods of physiological assay: one consisted in observing the action of muscarine chloride on a loop of rabbit intestine, a dilution of 1 part in 600 millions giving an appreciable effect; the other in the effect on toad's heart, a distinct inhibition resulting at a dilution of 1 part in 75 millions. Attention is called to the difficulty of separating choline and muscarine. Other substances obtained from tissue of *A. muscaria* were ergosterol, 1-leucine, mannitol, and fumaric acid.—*F. E. Denny.*

2074. MELL, C. D. The early uses of the yaupon. Amer. Forestry 28: 531. 1922.—The author briefly discusses *Ilex vomitoria* and its uses in the preparation of a tea and as a diuretic.—*Chas. H. Otis.*

2075. SAYRE, L. E. Standards of purity for medicinal agents. Trans. Kansas. Acad. Sci. 30: 232-233. 1919/21 [1922].—"This paper is contributed largely to give information as to what is now in evidence so far as medicinal standards are concerned and what the new revision committee of the U. S. Pharmacopoeia (10th) will be obliged to face."—*F. C. Gates.*

2076. SIMONSEN, JOHN LIONEL. The constitution of the terpene present in the essential oil from *Andropogon jwarancusa* Jones. Jour. Chem. Soc. [London] 121: 2292-2299. 1922.

2077. SIMONSEN, JOHN LIONEL. The essential oil from the leaves of *Abies pindrow* Spach. Indian Forest Rec. 8⁵: 1-5. 1922.—Oil extracted from *A. pindrow* shows 70 per cent pinene, with other turpines and alcohols. As the oil is expensive to extract and has so small an amount of turpentine, it is not of commercial importance.—*E. N. Munns.*

PHYSIOLOGY

B. M. DUGGAR, *Editor*W. J. ROBBINS, *Assistant Editor*

(See also in this issue Entries 1560, 1649, 1746, 1762, 1824, 1827, 1839, 1851, 1928, 1955, 2004, 2029, 2030, 2031, 2037, 2038, 2056, 2069, 2072, 2073, 2076, 2166)

GENERAL

2078. MOLISCH, HANS. *Pflanzenphysiologie als Theorie der Gärtnerei*. 3rd ed., 8 vo, xi + 326 p., 145 fig. Gustav Fischer: Jena, 1920.

DIFFUSION, PERMEABILITY

2079. BROWN, WILLIAM. On the preparation and use of collodion osmometers. *Ann. Botany* 36: 433-439. 1922.—A method is described of preparing thimble-shaped membranes of collodion for use as osmometers. They are accurate, easy to make and manipulate, and by treatment with alcohol of different strengths can be brought to any desired degree of permeability. The method of using them is also described and the results of experiments performed with them are given.—*W. P. Thompson*.

2080. TRÖNDLE, A. Neue Untersuchungen über die Aufnahme von Stoffen in die Zelle. [Cell absorption.] *Biochem. Zeitschr.* 112: 250-285. 1920.—Palisade cells of *Buxus sempervirens* and *Acer platanoides* absorbed no KCl or NaCl when narcotized by ether or chloral hydrate. At lower concentrations of the narcotics, slow absorption, as determined by plasmolysis, occurred. After treatment with dilute oxalic or hydrochloric acid, the palisade cells of *Buxus sempervirens* absorbed NaCl in proportion to the outer concentration instead of at a constant rate, as in the checks. *Spirogyra* (*S. majuscula* and *S. sp.*) cells absorbed quinine, caffeine, or piperidine, the product of outer concentration and the time required to precipitate the tannin present in the vacuole being a constant. In the presence of traces of acid no absorption occurred. Alkaloid bases, salts, and salts in the presence of dilute acid penetrated the cells in the same time when killed by chloroform.—*H. D. Hooker, Jr.*

WATER RELATIONS

2081. COUPIN, HENRI. Détermination de l'optimum d'humidité du milieu extérieur chez les Oscillaires. [The determination of the optimum humidity for the external medium of Oscillarias.] *Compt. Rend. Acad. Sci. Paris* 174: 822-824. 1922.—The author finds that the optimum humidity for the growth of this blue-green alga is that provided by a 1 per cent solution of gelatin.—*C. H. Farr*.

2082. SINGH, KHARAK. Development of root system of wheat in different kinds of soils and with different methods of watering. *Ann. Botany* 36: 353-361. 3 fig. 1922.—Specially planned experiments showed that wheat plants in pots grow better when watered from below than when watered from above. With light soil the difference is most marked in young plants; with heavy soils it becomes most conspicuous at later stages. Growth is best in pure sand over a layer of farm-yard manure. It is better in a mixture of 25 per cent sand and 75 per cent Rothamsted soil than in either a mixture of 50 per cent of each or pure Rothamsted soil.—*W. P. Thompson*.

MINERAL NUTRIENTS AND SALT RELATIONS

2083. GUILLEMIN, MADELEINE, and W. P. LARSON. The relation between the fixed and free salts of bacteria. *Jour. Infect. Diseases* 31: 344-355. 1922.—The diffusion of salts out of the dead cells of *B. coli* is demonstrated. The free salts are found to predominate over the fixed in the bacterial cells.—*R. V. Allison*.

2084. JONES, LINUS H., and JOHN W. SHIVE. Influence of wheat seedlings upon the hydrogen ion concentration of nutrient solutions. Bot. Gaz. 73: 391-400. 1922.—Solutions of Tottingham's series were used. Marked differences were found in the rates of reaction change. Those solutions resistant to change, indicating buffer action, were those with the highest volume-molecular proportions of soluble phosphate salts, though 1 exception to this was found. A tendency for the solutions to approach a common pH value (always through increase of the H-ion content) was observed. A solution modified by substituting $(\text{NH}_4)_2\text{SO}_4$ for KNO_3 in equivalent osmotic concentrations "has shown that the pH values of these solutions are not greatly altered by contact with the roots of young wheat plants between the ages of 4 and 5 weeks, the tendency always being toward a slight increase in the H-ion concentration of the solution during growth intervals of 3 or 4 days without renewal of the solutions. It is thus easily seen that for certain types of culture studies in which it is desirable to maintain the H-ion concentrations of the nutrient media within comparatively narrow variation limits, solutions of this kind possess marked advantages over those in which the H-ion concentrations are rapidly decreased by the action of the plants."—B. W. Wells.

2085. LESAGE, PIERRE. Étude des plantes salées, pendant la période où se produisent des anomalies. [Plants in hypertonic salt solutions, during the period of abnormal development.] Compt. Rend. Acad. Sci. Paris 174: 56-58. 1922.—In these further studies on the effect of different concentrations of sodium chlorid on the fruiting of *Lepidium sativum*, the author was able to grow plants to maturity in concentrations as high as 14 per cent; but the germination of the seed produced was very poor. The salt solution affects the absorption of water and ions, such as potassium. The seed of plants grown in cultures with high salt content are shorter and thicker than the controls. Sixty-five of 265 fruits of plants grown in high salt concentration showed 3-4 locules; only 1 out of 90 control plants had this abnormality. Little evidence is presented that this abnormality is inheritable. [See also Bot. Absts. 9, Entry 482.]—C. H. Farr.

2086. MASCHHAUPT, J. G. De samenstelling onzer cultuurgewassen in opeenvolgende groeiperioden. [The composition of crops in successive periods of growth.] Verslag. Landbouwk. Onderzoek. Rijkslandbouwproefsta. 25: 131-139. 1921.—This paper includes results of investigations made to determine: (1) during what part of the growing period the plant obtains mainly nitrogen or phosphorus; (2) whether the amount of nitrogen and ash constituents in the harvested crops is the maximum present at any period during growth; and (3) whether at the end of vegetative growth these substances are returned to the soil.—The soil used was a poor sand, the plot was fertilized with 80 kgm. nitrogen as $(\text{NH}_4)_2\text{SO}_4$, 96 kgm. P_2O_5 as Thomas slag, and 210 kgm. K_2O in the form of "patent kali."—Potatoes were planted April 26, 1919, and harvests and analyses made on June 4 and 20, July 4 and 26, August 11 and 29. Leaves and tubers but no roots were analyzed.—The weight (dry) of the leaves rises until the end of July, then decreases in early August. A marked decrease in the second half of August was due to dying of foliage. Nitrogen in the leaves is very high in the beginning, and then decreases slowly; in the tubers the nitrogen content decreases between July 4 and 26, but no more after that. It increases in the leaves to the beginning of July and is then seemingly transferred to the tubers, as the total nitrogen (leaves and tubers) seems to be constant. P_2O_5 decreases very much in the leaves, while in the tubers it seems to remain constant after an initial decrease. The total amount increases at the end of the growing period. Potassium increases in the leaves to early July, afterwards decreasing; in tubers it decreases very much during July, but increases later. SO_3 increases in leaves to July 26 and decreases after August 11, the total SO_3 increasing to the end. The Cl data are similar to those on SO_3 . CaO in leaves decreases to July 4 or July 26, the total amount increasing between July 4 and July 26 and then remaining constant. The MgO content is changeable in the leaves and constant in the tubers, the total increasing somewhat.—It was found that at the end of the growing period there is in potatoes no loss in nitrogen and ash constituents. What is lost in the leaves is deposited in the tubers. The slight decrease in Na_2O and CaO is possibly due to loss of foliage near the end of August.—A German résumé concludes the paper.—Peter J. Klapaak.

2087. SAUVAGEAU, C., et G. DENIGES. A propos des efflorescences du *Rhodymenia palmata*; présence d'un xylane chez les algues floridées. [The efflorescence of *Rhodymenia palmata*; the presence of xylane in the red algae.] *Compt. Rend. Acad. Sci. Paris* 174: 791-794. 1922.—The efflorescence of this alga is found to be due to KCl, but not to mannite or trehalose. [See also *Bot. Absts* 11, Entry 3020.]—*C. H. Farr.*

PHOTOSYNTHESIS

2088. STOKLASA, J. Die Bedeutung der Radioaktivität des Kaliums bei der Photosynthese. III. [The significance of the radioactivity of potassium in photosynthesis.] *Biochem. Zeitschr.* 108: 173-184. 1920.—Reasons are given for considering that magnesium has no relation to photosynthesis. Carbon assimilation is considered a decomposition of potassium bicarbonate under the influence of light to formic acid, oxygen, and potassium carbonate, and the further decomposition of formic acid to formaldehyde and oxygen. The β - and γ -rays of potassium are thought to be important in photosynthesis.—*H. D. Hooker, Jr.*

METABOLISM (GENERAL)

2089. BRIDEL, MARC. Sur la présence d'un glucoside à essence dans les tiges foliées et les racines du *Sedum Telephium* L. [On the presence of a glucoside in the leafy shoots and roots of *Sedum Telephium*.] *Compt. Rend. Acad. Sci. Paris* 174: 186-188. 1922.—The amount of reducing sugar in the extract is increased after treating with invertin, and still more if treated with emulsin. This is taken as evidence of the presence of a glucoside upon which these enzymes act. The physical and chemical properties of the glucoside are described.—*C. H. Farr.*

2090. CLARK, E. P. The structure of fucose. *Jour. Biol. Chem.* 54: 65-73. 1922.—Fucose was prepared from *Ascophyllum nodosum* by an improved method. Fucose ($C_6H_{12}O_5$) may be considered as a methyl pentose. The positions of the hydroxyl groups on carbon atoms 2, 3, and 4, heretofore determined by purely chemical means, have been verified by a study of the optical properties of preparations from fucose.—*G. B. Rigg.*

2091. COHEN, CLARA. Über die Bildung von Acetaldehyd bei den Umsetzungen von Zucker durch Pilze. [Acetaldehyde formation in sugar decomposition by fungi.] *Biochem. Zeitschr.* 112: 139-143. 1920.—The formation of acetaldehyde from glucose by *Aspergillus cellulosa*, *Monilia candida*, *Mucor racemosus*, *M. Rouzii*, and *Oidium lactis* was demonstrated by using disodium sulphite or calcium sulphite.—*H. D. Hooker, Jr.*

2092. COMBES, RAOUL. La recherche des pseudo-bases d'anthocyanidines dans les tissus végétaux. [The pseudo-bases of the anthocyanidines of plant tissues.] *Compt. Rend. Acad. Sci. Paris* 174: 58-61. 1922.—An attempt is made to establish the conclusion that the substances considered by Noack as pseudo-bases of anthocyanidines are really phlobatannins. The tissues employed were the leaves of *Ampelopsis hederacea*, of grapes, and of apples; also the pericarp of *Aesculus Hippocastanum*.—*C. H. Farr.*

2093. FÄRBER, E., und F. F. NORD. Die phytochemische Reduktion des Acetols zu optischaktivem Propylenglykol. [Phytochemical reduction of acetol to optically active propylene glycol.] *Biochem. Zeitschr.* 112: 313-323. 1920.—Acetol, which is optically inactive, was reduced by yeast to levorotatory propylene glycol.—*H. D. Hooker, Jr.*

2094. HADJIOPOULOS, L. G. Complement fixation in typhoid fever. *Jour. Infect. Diseases* 31: 226-232. 1922.—The formation of complement-fixing bodies was observed as one of the earliest and most constant immune manifestations in the course of typhoid infection. The satisfactory application of the complement-fixation test in the diagnosis of the fever is described.—*R. V. Allison.*

2095. IRVINE, JAMES COLQUHOUN, and EDMUND LANGLEY HIRST. The constitution of polysaccharides. Part V. The yield of glucose from cotton cellulose. Jour. Chem. Soc. [London] 121: 1585-1591. 1922.—Careful methods, described in detail, were used, anhydrous cotton cellulose being first converted into cellulose triacetate, then into alpha- and beta-methylglucosides, then into glucose. "Considering the standard of purity in which the mixed methylglucosides were isolated, there can be no further doubt that cotton cellulose is composed entirely of glucose residues."—F. E. Denny.

2096. JOYNER, REGINALD ARTHUR. The viscosity of cellulose in cuprammonium hydroxide solution. Part I. The determination of the viscosity. Jour. Chem. Soc. [London] 121: 1511-1522. Fig. 1. 1922.—An apparatus was devised for dissolving cotton cellulose and measuring the viscosity by the falling-sphere method. Cuprammonium solutions of high cellulose-dissolving power were prepared by bubbling air through a mixture of clean copper turnings and strong ammonia. Adding about 1 gm. of sucrose per l. hastened the dissolution of the copper and protected the reagent against the loss of dissolved copper on standing. A study was made of the effect on the viscosity produced by varying the relative proportions of copper, ammonia, and cellulose. The most suitable proportion for viscosity measurements varied with the type of cotton, but for general use a solution containing 13 gm. of dissolved copper, 20 gm. of cellulose, and 200 gm. of ammonia per l. is recommended. With high copper concentration and low ammonia content cellulose is gelatinized and dissolves slowly. Large variations in viscosity values resulted from the difficulty in taking a representative sample of cotton.—F. E. Denny.

2097. OSBORNE, T. B., A. J. WAKEMAN, and C. S. LEAVENWORTH. The water-soluble constituents of the alfalfa plant. Jour. Biol. Chem. 53: 411-429. 1922.

2098. RICHARDSON, WILLIAM D. The vitamine doctrine and the oleomargarine industry. 16 p. Institute of Margarin Manufacturers: Washington, 1921.—In this paper there is presented a brief discussion of the vitamins and their occurrence. Emphasizing the variety of plant and animal products in which the fat-soluble vitamin (A) occurs, the author endeavors to show that "given an ordinary, every day, reasonable well balanced diet for the average man, woman or child, it does not make any difference from the dietary standpoint whether the individual eats oleomargarine or butter,"—B. M. Duggar.

2099. SAMEC, M., und H. HAERDTL. Studien über Pflanzenkolloide IX. Zur Kenntniss verschiedener Stärkearten. [Plant colloids IX. Starches.] Kolloidchem. Beih. 12: 281-300. 1920.—The authors used carefully prepared starches from potato, *Maranta arundinacea*, *Mannihot utilissima*, *Curcuma Zedcaria*, horse chestnut, wheat, *Oryza glutinosa*, maize, and rice, and found that all contain an electrodialytically precipitable, viscous portion that conducts electricity (A. Meyer's β -amylose; L. Maquenne's amylopectin) and a portion that is the opposite in all these respects (Maquenne's amylose). The relative amounts of these 2 are different in different starches, as are also the water content of the grain, the viscosity of the starch solution, and the rapidity with which diastase acts on the starch. All starches contain phosphorus, the variation in amount being paralleled by the electric conductivity of the electrodialyzed solution. The method of union or degree of saturation of the phosphoric acid varies, however. All starches react with alkalies and become more fluid as the temperature is raised.—H. E. Pulling.

2100. STOKLASA, J. Der Mechanismus der physiologischen Wirkung der Radiumemanation und der Radioaktivität des Kaliums auf die biochemischen Vorgänge bei den Wachstumsprocess der Pflanzen. II. [Mechanism of the action of radium and radioactive potassium on biochemical processes in plant growth.] Biochem. Zeitschr. 108: 140-172. 1920.—Under the influence of radium emanations for 5 days, 48.04 per cent of the total nitrogen was converted to amide nitrogen by proteolytic enzymes, as compared with 32.16 per cent under control conditions. Radium emanations stimulated the development and metabolism of many plants,

the dosage depending on the plant. Stimulation was produced by a weak dosage in all but potash plants, such as the sugar beet, in which growth was depressed. Tissues rich in potassium were found to be sensitive to radium emanations. This was found especially true of green tissues, etiolated leaves being deficient in potassium. The toxic action of radium is attributed to the products of augmented carbon assimilation. Radium exerted no toxic influence on the chlorophyll-free cells of bacteria, in spite of their being rich in potassium.—*H. D. Hooker, Jr.*

2101. WASICKY, RICHARD. Ein Beitrag zur Kenntnis der Rolle der Pflanzenglycoside. [The role of plant glucosides.] *Biochem. Zeitschr.* 113: 1-18. 1921.—Several samples of the isolated leaves and stems of *Digitalis purpurea* about 1 year old were placed separately in Knop's nutrient solution and in tap water. Some were exposed to sunlight and others kept in the dark for a varying period of time, at the end of which the effect produced upon glucosidal content was determined, using the biological method for assaying the digitalis glucosides. Experiments were also carried out to determine the action of the accompanying enzymes and to locate the glucosides in the leaves by microchemical reactions. The writer states that the quantity of the glucosides in digitalis follows the assimilation curve, being at its maximum at the time when assimilation is at its greatest intensity. He concludes that glucosides undoubtedly play an important part in regulating the turgidity of plant cells.—*J. M. Marañon.*

METABOLISM (NITROGEN RELATIONS)

2102. HOFFMAN, WALTER FRED, and ROSS AIKEN GORTNER. Sulfur in protein 1. Effect of acid hydrolysis upon cystine. *Jour. Amer. Chem. Soc.* 44: 341-361. 1922.

2103. JONES, D. B., C. E. F. GERSDORFF, C. O. JOHNS, and A. J. FINKS. The proteins of the lima bean, *Phaseolus lunatus*. *Jour. Biol. Chem.* 53: 231-240. 1922.—The lima bean meal used yielded 21.17 per cent of protein, consisting of 2 globulins and an albumin, all 3 containing tryptophane.—*G. B. Rigg.*

2104. VICKERY, H. B. The rate of hydrolysis of wheat gliadin. *Jour. Biol. Chem.* 53: 495-511. 1922.—Acid hydrolysis of this protein is a continuous process proceeding from first to last without marked interruption due to the existence of stable complexes, and is, therefore, clearly distinguished from enzymatic hydrolysis.—*G. B. Rigg.*

2105. WARBURG, O., und E. NEGELEIN. Über die Reduktion der Salpetersäure in grünen Zellen. [Nitric acid reduction in green cells.] *Biochem. Zeitschr.* 110: 66-115. 1920.—*Chlorella pyrenoides* Chick was transferred from Knop's solution to a solution of $\frac{N}{10}$ sodium nitrate- $\frac{N}{10}$ nitric acid, and nitrate reduction was studied under thermostatic conditions. Gas exchange was measured with the Haldane apparatus and also by measuring the difference in gas pressure between 2 vessels in 1 of which the evolved CO_2 was absorbed by 5 percent KOH. A Haldane-Barcroft gas manometer was used. NH_3 was determined by Nessler's colorimetric method and HNO_2 with α -naphthylamine sulphanilic acid. Nitrate reduction occurred in the dark, the CO_2 - O_2 ratio being 1.3:2.0. CO_2 equal to the O_2 consumption resulted from respiration, the excess CO_2 being produced by nitrate reduction in decreasing amounts over several hours. NH_3 was produced simultaneously in increasing amounts until 1 molecule was produced for every 2 of CO_2 according to the reaction: $HNO_3 + H_2O + 2C$ (in organic combination) = $NH_3 + 2CO_2 + 162,000$ cal. Until this equation is reached, part of the NH_3 is thought to be assimilated. Only 30 per cent of the energy evolved is available to the cell in the form of chemical energy. Nitrate reduction was 20 times as sensitive to HCN as carbon assimilation. This is thought to indicate that the 2 processes are independent and that catalytically active heavy metals participate in nitrate reduction. 0.013 per cent phenylurethan completely inhibited carbon assimilation, reduced the formation of extra CO_2 30 per cent and stimulated respiration. At low partial pressures of O_2 nitrous acid was formed, NH_3 production was decreased in proportion, and the cells were poisoned by the nitrite and died. HCN did not depress nitrite formation. When illuminated the cells evolved $2\frac{1}{2}$ -3 times as

much extra O_2 as extra CO_2 produced in the dark, and 2-3 times as much NH_3 . The reaction never reached the equation $HNO_3 + H_2O = NH_3 + 2O_2$ as nitrogen assimilation continued uninterrupted during illumination, producing an NH_3 deficit. Illumination increased nitrogen reduction but independently of carbon assimilation. When narcotized, illuminated cells gave off extra CO_2 . The stimulating effect of light is thought to result from increased absorption of nitric acid.—*H. D. Hooker, Jr.*

METABOLISM (ENZYMES, FERMENTATION)

2106. BIJL, PAUL A. VAN DER. Studies on some fungi and the deterioration of sugar. Union South Africa Dept. Agric. Sci. Bull. 18. 19 p. 1920.—The fungi studied are *Penicillium divaricatum*, strains of the *Aspergillus repens glaucus* group, strains of the *Penicillium luteum purpurogenum* series, *Aspergillus niger*, *A. terreus*, and *A. fumigatus*. The growth of these fungi was observed in sugar solutions of different densities and studies were made of the influence of acidity or alkalinity and of chlorides upon the inversion of sucrose by fungi, the hygroscopic nature of the decomposition products of dextrose, the influence of different moisture contents on the deterioration of refined sugar infected with fungi, the effect of partial sterilization by heat, and the effect of various disinfectants on the fungi.—The normal losses due to inversion in sucrose in mills can be attributed to (1) the enzyme invertase which is normally present in cane, and (2) the enzyme secreted by various microorganisms.—The inversion of sugar by microorganisms is influenced by temperature, the moisture present in the sugar, humidity of the atmosphere, exposure to infection by microorganisms, and hygroscopic non-sucrose substances present in raw sugar. All these factors can be controlled to a large extent.—*E. M. Doidge.*

2107. DAVISON, WILBURT C. Filterable "substance" antagonistic to dysentery and other organisms (d'Herelle's phenomenon, bacteriophage, bacteriolytic agent, bacteriolysant, etc.). Absts. Bact. 6: 159-177. 1922.—This is an extensive, analytical, and critical review of the literature which deals with the d'Herelle phenomenon, namely, that Berkefeld filtrates of stool cultures and of cultures from other sources kill and dissolve dysentery bacilli and other organisms. D'Herelle's idea that this agent is the living *Bacteriophagum intestinale* is rejected and it is concluded: that the phenomenon probably depends upon a bacteriolytic enzyme produced by bacteria; that the amount of this enzyme produced by a culture can be increased by external influences; that the action of these external influences is probably to favor the development of lysogenic organisms at the expense of non-lysogenic; that this enzyme not only dissolves organisms but also favors the multiplication of bacteria which produce this enzyme; and that it is highly improbable that this phenomenon represents a defense mechanism on the part of an animal against bacterial invasion.—The publications of 32 authors are noted in the bibliography.—*D. Reddick.*

2108. EFFRONT, JEAN. Sur les propriétés distinctives des amylases de différentes provenances. [On the distinctive properties of amylases from different sources.] Compt. Rend. Acad. Sci. Paris 174: 18-21. 1922.—A new method is employed in this study, namely, the coagulation of starch by iodine. Amylases were studied from 18 sources, including human and vegetable material. They are compared as to ability to liquefy and to saccharify starch expressed as grams per hour, and also as to the intensity with which they accomplish hydrolysis in the presence of an excess of diastase after 5 hours of optimum temperature. The amylases are found to vary much in these properties. The optimum temperature for liquefaction is also highly variable. The filtration of some of the amylases is found to increase their activity, possibly due to the adherence to the filter and consequent removal of certain colloidal substances which may have a retarding effect on the reaction.—*C. H. Farr.*

2109. HAAR, A. W. VAN DER. Die Entbehrlichkeit des Mangans für das Oxydasenmolekül bei der Züchtung von *Hedera helix*, und die Bertrandsche Mangantheorie der Oxydasen. [The superfluity of manganese in the oxydase molecule produced by *Hedera helix* in culture, and Bertrand's manganese-oxidase theory.] Biochem. Zeitschr. 113: 19-28. 1921.—

Germinating and growing *Hedera helix* in nutrient culture solutions practically free from manganese, van der Haar obtained plants containing only 0.02 mgm. of manganese in 12.4 gm. of green weight. The ungerminated seed contained 0.001 mgm. manganese per seed. The 12.4 gm. was the weight of one plant, which showed a slight increase in manganese over that found in the seed. The oxidase obtained from these plants gave all the normal reactions characteristic of oxidase from plants growing under normal conditions. The writer concludes that Bertrand's manganese theory, according to which the oxidase is a manganese protein compound, is not applicable to the *Hedera* oxidase, which he thinks is to be considered as a glucoprotein compound.—*F. G. Gustafson.*

2110. IREDALE, THOMAS. The role of protective colloids in catalysis. Part II. Jour. Chem. Soc. [London] 121: 1536-1542. 1922.—This is a study of the effect of certain colloids in inhibiting the catalytic decomposition of H_2O_2 by colloidal platinum. Effectiveness was shown to be related to the method of preparation of the inhibitor. A comparison is made of 2 solutions of gelatin of the same concentration, 1 thought to consist of a large number of small particles, the other of a small number of large particles. The latter was always less effective as an inhibitor at low concentrations (0.000005 per cent) and not always at high (0.01 per cent). The "inhibition number" was defined as "that percentage of protective colloid which is just insufficient to inhibit catalytic action." Gelatin, egg-albumin, dextrin, and starch were effective in the order named. The same order holds for the Zsigmondy-gold-number coagulation-effect, and the 2 phenomena are thought to be related to the same property—"the capacity of the protective colloid for inhibiting further adsorption."—*F. E. Denny.*

2111. KÖHLER, E. Über Fermentbildung. [Enzyme formation.] Biochem. Zeitschr. 112: 236-254. 1920.—The production of zymogen and activation to zymase in yeast are stimulated independently; 5 per cent maltose retards the former and stimulates the latter; 5 per cent sucrose, glucose or fructose stimulates the former and retards the latter. Zymogen production is thought to occur in the outermost regions of the living substance.—*H. D. Hooker, Jr.*

2112. KÖHLER, E. Untersuchungen über den Gang der alkoholischen Gärung der Hefe. [The course of alcoholic fermentation by yeast.] Biochem. Zeitschr. 108: 235-243. 1920.—The rate of fermentation was measured by counting the bubbles of gas given off per minute. The course of fermentation was found to be irregular and dependent on the concentration of sugar. Increase in the concentration of alcohol during fermentation induced smaller rhythmic fluctuations in the rate of the reaction. Retardation and stimulation are thought to alternate during the course of fermentation.—*H. D. Hooker, Jr.*

2113. KÖHLER, E. Untersuchungen über den Ablauf der alkoholischen Gärung der Hefe. II. [The course of alcoholic fermentation by yeast.] Biochem. Zeitschr. 110: 128-132. 1920.—The larger rises and falls in the curve of alcoholic fermentation in response to changes in the concentration of sugar are characterized as "zig-zag phenomena."—*H. D. Hooker, Jr.*

2114. MICHAELIS, L., und M. ROTHSTEIN. Zur Theorie der Invertasewirkung. [Theory of invertase action.] Biochem. Zeitschr. 110: 217-233. 1920.—Invertase acting on 2-40 per cent sucrose in acetate or phosphate buffer solutions of various H-ion concentrations indicated that invertase combined with 1 molecule of sucrose to form an acid with dissociation constant of 3×10^{-7} . Under the experimental conditions (low salt content of the solutions and absence of marked colloid precipitants) the acid appeared molecularly dispersed and dissociated. The undissociated molecules decomposed spontaneously into the products of the enzymatic reaction. The anions were stable. This is thought to explain the effect of pH values from 3.5 to alkalinity on invertase activity.—*H. D. Hooker, Jr.*

2115. MORAN, THOMAS, and WILLIAM CUDMORE McCULLAGH LEWIS. Studies in catalysis. Part XVI. The inversion of sucrose by hydrogen ion. Jour. Chem. Soc. [London] 121: 1613-

1624. 1922.—H-ion concentrations and inversion-velocity constants were measured. These data, together with values for the viscosity of the solution and for the osmotic and vapor pressure of sucrose, permitted the authors to suggest a mechanism of the inversion process. Two consecutive reactions are involved. The activity of the H-ion was markedly increased in the presence of sucrose.—*F. E. Denny.*

2116. NEMEC, A. Über Urikase im Samenorganismus. [Uricase in seed.] *Biochem. Zeitschr.* 112: 286-290. 1920.—Five gm. soy-bean meal added to 100 cc. 0.3 per cent potassium urate and 5 cc. toluol decomposed the uric acid to NH_3 and CO_2 at 35°C . The enzyme activity was greater in the presence of atmospheric O_2 .—*H. D. Hooker, Jr.*

2117. NEUBERG, C., und M. SANDBERG. Weitere Mitteilungen über chemisch definierte Katalysatoren der alkoholischen Gärung. [Chemically defined catalyzers of alcoholic fermentation.] *Biochem. Zeitschr.* 109: 290-329. 1920.—Experiments with 82 substances including metallic as well as organic compounds showed that all reducing substances stimulated alcoholic fermentation by living yeast cells and by enzyme preparations. This is thought to show a relation between the activation of fermentation and deoxidation.—*H. D. Hooker, Jr.*

2118. NEUBERG, C., und W. URSUM. Die dritte Vergärungsform des Zuckers als allgemeine Folge der Dismutationswirkung anorganischer und organischer Alkalisatoren. [The third type of sugar fermentation as a general result of "dismutation" by inorganic or organic compounds producing an alkaline reaction.] *Biochem. Zeitschr.* 110: 193-215. 1920.—Substances such as ammonium bicarbonate, potassium pyrophosphate, etc., that tend to produce an alkaline reaction in solution induced the fermentation of sucrose to acetic acid, alcohol, carbon dioxide, and glycerol.—*H. D. Hooker, Jr.*

2119. PETERSON, W. H., E. B. FRED, and J. A. ANDERSON. The fermentation of hexoses and related compounds by certain pentose-fermenting bacteria. *Jour. Biol. Chem.* 53: 111-123. 1922.—This new group of pentose-fermenters converts glucose, fructose, lactose, raffinose, and melezitose almost quantitatively into lactic acid.—*G. B. Rigg.*

2120. PETERSON, W. H., E. B. FRED, and E. G. SCHMIDT. The fermentation of pentoses by molds. *Jour. Biol. Chem.* 54: 19-34. 1922.—Twenty-five species, representing *Aspergillus*, *Penicillium*, and *Mucor*, were studied, 16 of which fermented pentoses (xylose and arabinose) with rapidity. Most of the remaining 9 cultures grew slowly, although 3 or 4 produced only a few mycelial threads. The best fermenters were found among species of *Aspergillus* and *Penicillium*, although a number of molds of these types only slowly attacked the pentoses. The *Mucors*, *Rhizopus nigricans*, and *Cunninghamella* were also found to be very slow fermenters. From these results it is suggested that pentoses might be of considerable value in the separation and classification of fungi.—*G. B. Rigg.*

2121. RONA, P. Über die Wirksamkeit der Fermente unter abnormalen Bedingungen und über die angebliche Aldehydnatur der Enzyme. [Enzyme activity under abnormal conditions and the reputed aldehyde character of enzymes.] *Biochem. Zeitschr.* 109: 279-289. 1920.—The enzymes pepsin, trypsin, amylase, emulsin, invertase, and maltase retained their hydrolytic activity in the presence of sodium bisulphite, hydroxylamin, benzolsulphhydroxamic acid, disodium sulphite, potassium cyanide, and phenylhydrazine, —reagents that react with aldehydes,—provided the H-ion concentration was regulated. This is thought to disprove the aldehyde character of enzymes.—*H. D. Hooker, Jr.*

2122. RONA, P., und P. GRÖRGY. Zur Kenntnis der Urease. Zugleich ein Beitrag zum Studium der Giftwirkungen. [Urease. A study of toxicity.] *Biochem. Zeitschr.* 111: 115-133. 1920.—The optimum pH value of 7.3-7.5 for soy-bean urease activity was confirmed. Acceleration of urease action by blood serum occurred only in prolonged experiments. No acceleration by amino-acids or retardation by H_2O or NaCl was detected. Inhibition of urease and lipase by various arsenic compounds was investigated.—*H. D. Hooker, Jr.*

ORGANISM AS A WHOLE

2123. FITCH, C. P. The cultivation of *Bacterium abortus* Bang. Jour. Infect. Diseases 31: 233-236. 1922.—The use of horse serum-beef infusion agar with a pH of 6.8-7.2 and an atmosphere of 10 per cent CO₂ or H₂ is described as giving most satisfactory results in the cultivation of this organism.—R. V. Allison.

2124. GALE, G. W. A preliminary account of some investigations on leaf-aeration in certain Natal plants. South African Jour. Sci. 18: 153-155. 1921.—The quantitative results given illustrate and confirm an important ecological principle, namely, that pioneer types are more variable in their physiological functions than subsequent types, and for that reason able to adapt themselves to the more varied conditions presented by the habitat during early stages in plant succession.—E. P. Phillips.

2125. LOTKA, ALFRED J. Contribution to the energetics of evolution. Proc. Nation. Acad. Sci. [U. S. A.] 8: 147-151. 1922.—“In every instance considered, natural selection will so operate as to increase the total mass of the organic system, to increase the rate of circulation of matter through the system, and to increase the total energy flux through the system, so long as there is presented an unutilized residue of matter and available energy.” Evolution tends to produce a maximum energy flux, provided the hereditary variations available for selection include some that tend toward increase of energy flux.—Howard B. Frost.

2126. LOTKA, ALFRED J. Natural selection as a physical principle. Proc. Nation. Acad. Sci. [U. S. A.] 8: 151-154. 1922.—The 1st and 2nd laws of thermodynamics do not, in general, completely determine the course of physical events, either in the presence or in the absence of life. Other principles must be added to explain fully what really occurs. One such principle is that of natural selection, or of “the persistence of stable forms.” The units of organic evolution are “energy transformers subject to irreversible collisions of peculiar type—collisions in which trigger action is a dominant feature.” Natural selection “functions, as it were, as a 3rd law of thermodynamics (or a 4th, if the 3rd place be given to the Nernst principle).” —Howard B. Frost.

2127. PEROTTI, R. Per la conoscenza dei rapporti fra microrganismi e pianta verde. [The relation between microorganisms and higher plants.] [Abstract.] Boll. Mens. R. Staz. Patol. Veg. 2: 96-99. 1921.

2128. VERZAR, F., und J. BÖGEL. Weitere Untersuchungen über Stoffwechselregulierung bei Bakterien. [Regulation of metabolism in bacteria.] Biochem. Zeitschr. 108: 207-219. 1920.—*Bacillus coli communis*, *B. paratyphi* B, and *B. proteus* X19 produced maximum acidity in 1 per cent glucose. At lower concentrations alkali formation followed the initial acid production. The titratable acidity at the above mentioned maximum and the threshold concentration at which alkali formation began were highest in *B. coli*. *Streptococcus haemolyticus* never produced alkali. The ultimate acidity was independent of the initial reaction. Gas formation was synchronous with acid production in *B. coli*; oxygen consumption as measured by Bancroft's apparatus was greater during alkali formation. No connection was found between movement and gas formation in *B. paratyphi*. Ethyl and methyl alcohol, chloroform, and formaldehyde retarded gas exchange in *B. coli* at concentrations much below the inhibiting dose. The toxicity of the alcohols was peculiar in that it was summated with that of the acids formed from glucose, so that a lower maximum acidity was reached in the presence of alcohol. Methyl alcohol was less toxic than ethyl.—H. D. Hooker, Jr.

GROWTH, DEVELOPMENT

2129. BROWN, WILLIAM. On the germination of fungi at various temperatures and in various concentrations of oxygen and of carbon dioxide. Ann. Botany 36: 257-283. 4 fig. 1922.—This paper describes experiments which had for their object the examination of the

behavior of certain storage rot fungi under the conditions prevailing in the practice of fruit storage. The fungi used were: *Botrytis cinerea*, *B. parasitica*, *Mucor* sp., *Rhizopus nigricans*, *Penicillium glaucum*, *Monilia cinerea*, *Fusarium* sp., *Phoma roseola*, *Alternaria Grossulariae*, and *Sphaeropsis malorum*. A series of experiments was first carried out dealing with the effect on germination of various concentrations of CO₂ and O₂. It was found that within wide limits O₂ had little effect on the germination and growth of these fungi. The latter processes were retarded by CO₂ and this retardation was more marked the lower the temperature and the weaker the nutrient in which the fungus spores were sown, and, to a less degree, it was more marked the greater the density of the medium. The author discusses the practical considerations which arise from his work. He concludes that the experimental results indicate that the gas storage method is most effectively used in combination with the ordinary cold storage method, and that it will give the best results when no attack of the fruit has begun previous to storage, and when conditions are such that a minimum of nutrients is available to fungous spores on the surface of the fruit. A review is given of the most recent and important papers dealing with the effect of temperatures on the growth of fruit-rot organisms.—W. P. Fraser.

2130. RIPPEL, AUGUST. Über die Wachstumskurve der Pflanzen. [Regarding the growth curves of plants.] Landw. Versuchssta. 97: 357-380. 1921.—This is a further discussion [see Bot. Absts. 9, Entry 519] of the applicability of the growth curves of Robertson and Mitscherlich [see Bot. Absts. 9, Entries 517, 518].—B. M. Duggar.

MOVEMENTS OF GROWTH AND TURGOR CHANGES

2131. ZAEFFEL, EDGAR. Sur le mécanisme de l'orientation des feuilles. [On the mechanism of orientation of leaves.] Compt. Rend. Acad. Sci. Paris 174: 119-120. 1922.—By splitting the petiole lengthwise and noting the curvature and torsion of the half petiole in either air or water, it is concluded that the petiole adjusts the orientation of the blade by differences in the water content of the various parts.—C. H. Farr.

GERMINATION, RENEWAL OF ACTIVITY

2132. LESAGE, PIERRE. Sur la détermination de la faculté germinative autrement que par la germination des graines. [The determination of the germinating power of seed in some other way than by germinating them.] Compt. Rend. Acad. Sci. Paris 174: 766-767. 1922.—The viability, that is the germinating power, of the seeds of *Lepidium sativum*, it was found, can be determined by the use of 20 different solutions of potash. Those seeds which become colored in a 2⁻⁵N to $\frac{2}{3}$ 2⁻⁹N solution will not germinate. Those which remain uncolored in these solutions are viable and will germinate. The color appears within 4 hours.—C. H. Farr.

2133. NEMEC, ANTONIN, et FRANTISEK DUCHON. Sur une méthode indicatrice permettant d'évaluer la vitalité des semences par voie biochimique. [A biochemical method permitting the evaluation of the viability of seed.] Compt. Rend. Acad. Sci. Paris 174: 632-634. 1922.—The method consists in determining the activity of the catalase. This is accomplished by finding the amount of O₂ liberated from H₂O₂. This is found to be in direct proportion to the germinating power. Oats which will not germinate at all may liberate as low as 4.1; those which have 100 per cent germination liberate about 78.6; and those with 66 per cent germination liberate 57.1. The same is true with peas, although in this case the proportion corresponds even more closely than with oats.—C. H. Farr.

RADIANT ENERGY RELATIONS

2134. GORIS, A., et H. DELUARD. Influence des radiations solaires sur la culture de la belladone et la formation des alcaloïdes dans les feuilles. [The influence of solar radiations on the culture of belladonna and the formation of alkaloids in leaves.] Compt. Rend. Acad. Sci. Paris 174: 188-190. 1922.—Experiments were run in triplicate. Set A, in the sunlight, continuously yielded 0.65 per cent alkaloid for the 1st crop and 0.52 per cent for the 2nd. Set B, in the shade for 6 weeks, and in the sun for 6 weeks, yielded only 1 crop of 0.42 per cent.

Set C, in the shade throughout the growing season, yielded nearly as much as B. It is concluded that plants growing in the sun will furnish 7-8 times the amount of alkaloid as those grown in the shade.—*C. H. Farr.*

TOXIC AGENTS

2135. ACEL, D. Über die oligodynamische Wirkung der Metalle. [The oligodynamic action of metals.] *Biochem. Zeitschr.* 112: 23-26. 1920.—The oligodynamic action of water in contact with metallic silver was shown to be due to the presence of silver compounds in solution which formed silver sulphide with ammonium sulphide after evaporation of the water. Water treated with ammonium sulphide lost its oligodynamic properties.—*H. D. Hooker, Jr.*

2136. CONOVER, JOHN R. The determination of the value of certain soaps in disinfecting wall and floor surfaces. *Amer. Jour. Public Health* 12: 602-605. 1922.

2137. DOERR, R. Zur Oligodynamie des Silbers. II. [Oligodynamics of silver.] *Biochem. Zeitschr.* 107: 207-218. 1920.—The bactericidal action of metallic silver was destroyed by previous heating of the metal, by repeated boiling in distilled water, or by prolonged imbedding in agar. It was reactivated by contact with strongly dissociated acids in dilute solution. The oligodynamic chemical was dialyzable, though at a different rate from silver oxide under certain conditions. No such difference was observed in the diffusibility through agar. In agar, the sterile zone about metallic silver, or silver oxide or nitrate, was surrounded by 2 concentric rings where bacterial colonies developed to unusual size. Similar zones (hemolytic) occurred about silver in blood-agar and this action could be destroyed by the same means as the bactericidal action, which is thought to be due to water-soluble silver compounds formed at the surface of the metal.—*H. D. Hooker, Jr.*

2138. DOERR, R. Zur Oligodynamie des Silbers. III. Mitteilung. [The oligodynamics of silver. III.] *Biochem. Zeitschr.* 113: 58-69. 1921.—On heating metallic silver until the edges begin to melt it loses its bactericidal property. On remaining in air this toxic property is regained, but not if kept under liquid paraffin. By further experiments the writer shows that a given area of metallic silver possesses a definite amount of toxic substance, and that if this is dissolved the silver is no longer toxic until the metal again has been exposed to air for some time. Thus an area of 200 square cm. gives off twice as much toxic substance as does an area of 100 square cm. From these experiments the writer draws the conclusion that the silver as such is not the toxic substance (oligodynamic property), but that the bactericidal property or substance is a soluble compound of silver formed in the presence of air, probably Ag_2O . In still further experiments the writer found that typhus bacteria were less influenced by the bactericidal action of silver than were the coli bacteria. Thus when grown on a solid medium with a piece of imbedded metallic silver an area 1.5 mm. wide surrounding the silver remained free from bacteria; in the next 1.5 mm.-zone there were only typhus bacteria; beyond this both typhus and the coli bacteria grew. By adding milk sugar to the agar this condition was further emphasized. Paratyphus bacteria of group A or B behaved like the typhus bacteria. The author thinks that by further work a method for separating these as well as other bacteria might be developed.—*F. G. Gustafson.*

2139. JACKSON, LLOYD E. The bacterial action of dry cleaning. *Amer. Jour. Public Health* 12: 507-509. 1922.—The "dry-cleaning" process, when properly conducted, has a very high and hygienically satisfactory bactericidal efficiency.—*C. A. Ludwig.*

2140. JULIANELLE, LOUIS A. Studies of hemolytic staphylococci. *Jour. Infect. Diseases* 31: 256-284. 1922.—Staphylococci were observed to produce a hemolytic substance in broth about the 6th day with a maximum at the 9th or 10th, disappearing on the 13th to 16th day. The nature and activity of the substance is described and it is thought to be associated with proteolysis and perhaps autolysis.—*R. V. Allison.*

2141. KAPPEN, H. Über die Aziditätsformen des Bodens und ihre pflanzenphysiologische Bedeutung. [The forms of soil acidity and their significance in relation to plant physiology.] Landw. Versuchssta. 96: 277-307. 1920.—The author discusses 3 characteristic forms of soil acidity. The 1st is exhibited by merely shaking the soil with water and determining the acid content by titration. This is due to free acids and acid salts. The 2nd is that type obtained by treating the soil with solutions of true neutral salts. This was originally taken to indicate the existence of humic acids but it is now known that such acidity is in part due to the occurrence of mineral acids in the extract. This phenomenon is now explained by adsorption or ion exchange, resulting from the interchange of ions between the neutral salts and certain aluminium and iron compounds which exist as colloidal constituents of the soil. The 3rd form of acidity is that induced by the capacity of the soil to dissociate such salts as consist of a strong base and a weak acid. The salts of this nature are characterized by hydrolysis in water. In the soil a part of the base is adsorbed and the corresponding acid is set free. This can be designated hydrolytic acidity. Throughout the paper the relation of humus type and content to the production of acidity is discussed, in particular the physiological significance of the 3rd form of acidity. In general the latter is considered to be uninjurious. With special reference to the importance of humic acids in respect to the growing plant, it is stated that the low solubility of these substances renders them of little consequence in soil acidity. They constitute, therefore, an extremely small part of the 1st form of acidity and likewise of the 2nd type, since in the latter case these acids do not affect neutral salts. In consequence, humic acids may be considered only in the 3rd category of acidity, that is, with hydrolytic acidity, in which category, however, they may not be regarded as injurious to plant growth. In the application of lime to soil it is held that the least effect is that of its action upon the humic acids.—B. M. Duggar.

2142. MACINNES, JEAN. The growth of the wheat scab organism in relation to hydrogen-ion concentration. Phytopathology 12: 290-294. Fig. 1. 1922.—A species of *Fusarium* isolated from scabby wheat was grown in a modified Czapek's solution plus a mixed buffer solution. The H-ion concentration was varied by the addition of increasing amounts of NaOH. The organism grew at all concentrations between pH 3 and pH 11.7. This range is decidedly wider than for any fungus previously studied; and, considering the large number of hosts attacked by this fungus, its tolerance of acid and alkaline media may be significant.—B. B. Higgins.

2143. PLANTEFOL, L. Sur le toxicité de divers phénols nitrés pour le *Sterigmatocystis nigra*. [The toxicity of various nitrogenous phenols towards *Sterigmatocystis nigra*.] Compt. Rend. Acad. Sci. Paris 174: 123-126. 1922.—A study is reported on the germination and growth of *Sterigmatocystis nigra* in ortho-, meta-, para nitrophenol; 1, 2, 4-dinitrophenol; and 1, 2, 4, 6-trinitrophenol. It is found that the nitrophenols are more toxic than phenol. The ortho-mononitrophenol is the least toxic of the mono-group; and the para- is the most toxic. The dinitrophenol is much more toxic than any of the mono-types. The trinitrophenol has a degree of toxicity like the mono-compounds.—C. H. Farr.

2144. PLOTHO, O. VON. Der Einfluss der kolloidalen Metallösungen nach Übertragung des Pilzmycels aus verschiedenen Nährsubstraten. [The influence of metals in colloidal solution after transfer of the mycelium from various nutrient solutions.] Biochem. Zeitschr. 110: 33-59. 1920.—The fixation of colloidal metals by the plant membrane occurred in the absence of organic colloids, but when the amount was insufficient to prevent all fixation, storage of the metal was inversely proportional to the amount of organic colloid. Since gold could be prepared in colloid solution without organic protective colloids, gold storage readily occurred. Silver and copper required protective colloids and in undiluted solutions there was no fixation. On dilution the degree of protection was reduced and eventually some silver and copper fixation occurred. Storage occurred when the charge on the membrane particles was positive, as in acid solution, the charge on the particles of colloidal metal being negative under all conditions. Hence, storage was possible only by those organisms that tended to

make the solution acid. By regulating the acidity of the hydrosol, storage could be regulated. Retardation of growth never occurred in colloidal gold solutions, but it appeared in colloidal silver and copper solutions and the smaller the colloid particles the greater the retardation. The resistance of the organisms varied, being less in *Aspergillus* than in other fungi and greater in *Bacillus Brassicae* than in *B. megatherium*. The toxicity of silver and copper was evident in delayed germination and conidia development, in swellings of the membrane, in the development of giant cells, in bendings and thickenings of the mycelium and of the membrane, and in modification of the conidiophores.—*H. D. Hooker, Jr.*

2145. RONA, P., und II. PETOW. Beiträge zum Studium der Giftwirkung. Versuche über die Giftwirkung des Thiodiglykols und seine Derivate an Sojabohnenurease. [The toxic action of thiodiglycol and its derivatives on soy-bean urease.] Biochem. Zeitschr. 111: 143-165. 1920.—Thiodiglycol was not toxic to urease. Thiodiglycol acetate and sulphonate do not affect the H-ion concentration; the former is not toxic, the latter is to a moderate degree. The dichloroethyl sulphide increases the H-ion concentration and completely inhibits urease activity when present in small amounts. It retards urease activity slightly when the H-ion concentration is regulated. The tetrachloroethyl sulphide increases H-ion concentration and inhibits urease activity even when the reaction is regulated.—*H. D. Hooker, Jr.*

2146. SCHNABEL, A. Über die Bestimmung zell- und keimschädigender Substanzen in dünnen Lösungen auf biologischem Wege. (I. Mitteilung: Optochin.) [Biological determination of optochin in dilute solutions.] Biochem. Zeitschr. 108: 258-278. 1920.—One part of optochin in a million or more could be determined by the effect on the reduction of methylene blue by pneumococci. The ultimate dilution that could be determined was a function of time, temperature, and number of bacteria. At room temperature 1 part in a billion could be detected qualitatively. Quantitative data were best obtained at 37°C.—*H. D. Hooker, Jr.*

2147. WALKER, W. F. The treatment of swimming pool water with ultraviolet rays. Amer. Jour. Public Health 12: 320-325. 1922.—Ultraviolet rays proved effective for keeping bacterial contamination in a swimming pool reduced to a low point.—*C. A. Ludwig.*

ELECTRICITY AND MECHANICAL AGENTS

2148. SZENT-GYÖRGYI, A. VON. Kataphoreseversuche an Kleinlebewesen. Studien über Eiweissreaktionen. III. [Cataphoresis experiments on micro-organisms. Studies on protein reaction. III.] Biochem. Zeitschr. 113: 29-35. 1921.—The writer found that in general bacteria migrated toward the anode, while some trypanosomes migrated toward the anode and others toward the cathode. He found that morphologically there is no difference between organisms that migrate to opposite poles. In these experiments the writer used a potential difference of 100 volts, the organisms being suspended in isotonic sugar solution, Ringer's solution (without the bicarbonate), or in a mixture of 3:1 of the 2. All solutions were kept at pH 7.0 (regulated with phosphate buffers).—*F. G. Gustafson.*

MISCELLANEOUS

2149. CHAMBERS, ROBERT. A new micromanipulator and methods for the isolation of a single bacterium and the manipulation of living cells. Jour. Infect. Diseases 31: 334-343. 1922.—The advantages of the instrument over those in use are presented and its structure indicated diagrammatically and by photograph. [See also following entry].—*R. V. Allison.*

2150. KAHN, MORTON C. Chambers' micromanipulator for the isolation of a single bacterium. Jour. Infect. Diseases 31: 344-348. 1922.—This is a discussion of advantages and manipulation of the instrument [see preceding entry].—*R. V. Allison.*

2151. SHEPPARD, S. E., and F. A. ELLIOTT. The drying and swelling of gelatine. Preliminary note. Jour. Amer. Chem. Soc. 44: 373-379. 1922.

SOIL SCIENCE

A. G. McCALL, *Editor*

(See also in this issue Entries 1534, 1542, 1543, 1545, 1554, 1560, 1567, 1569, 1570, 1571, 1591, 1592, 1593, 1594, 1595, 1596, 1608, 1611, 1723, 1725, 1836, 1840, 1843, 1878, 1891, 1910, 2082)

2152. ANONYMOUS. An outline of the uses of lime. Nation. Lime Assoc. Pamphlet 251. 8 p. 1922.

2153. ANONYMOUS. Eine einfache Methode zur Bestimmung des Säuregrades in Boden. [A simple method for determining the acidity of soils.] Mitteil. Deutsch. Landw. Ges. 37: 461-462. 1922.—A paper (title not given) by J. HISSINK, in Veldbode No. 1018, is reviewed. The work of Hissink was based on the method of Comber described in Jour. Agric. Sci. 10: 420-424. 1920.—A. J. Pieters.

2154. ANONYMOUS. Recent changes in artificial fertilizers. Agric. Gaz. New South Wales 33: 629-630. 1922.—The article discusses production changes which have come about during the past several years. These are most noticeable among nitrogenous fertilizers. Of these there are at least 7 recent kinds and much experimental work is necessary before these fertilizers can be used to best advantage.—L. R. Waldron.

2155. ANONYMOUS. The living soil. [Rev. of: FRANCÉ, R. H. Das Edaphon. Untersuchungen zur Ökologie der bodenbewohnenden Mikroorganismen. (Ecology of soil organisms.) 99 p. Franck'sche Verlagsbuchhandlung: Stuttgart, 1921.] Nature 110: 206-207. 1922.—The author coined the term "Edaphon" to cover all forms of life in the soil. He has performed a real service in bringing together scattered material, but has omitted reference to much recent work and perhaps over-emphasized the importance of soil organisms.—O. A. Stevens.

2156. BRAUND, H. J. The soils of the Murrumbidgee irrigation areas. How to develop their capacity for fruit production. Agric. Gaz. New South Wales 33: 631-638. 1922.—The physical structure of the soil is discussed and the total amount of plant food per acre to a depth of 4 feet is given. It is pointed out that when physical and chemical conditions in a soil are favorable for optimum plant growth, the biological factor readily adjusts itself. In certain of these soils it was found that the sub-strata were of single grain formation, preventing proper root penetration. Suggested methods for bringing about a crumb structure of soil in the sub-soil are discussed. Growing *Melilotus alba* in conjunction with deep application of gypsum is the method recommended.—L. R. Waldron.

2157. DEUSS, J. J. B. Groenbemesters in theetuinen. [Green manures in tea gardens.] De Thee 2: 50-51. 1921.—The tea experiment station in Java has recommended the planting of legumes in the tea gardens, but the planters have been slow to accept the idea. Experience with *Tephrosia* for soil improvement and partial control of weed grasses is described. If the legume is properly placed and pruned it does not suppress the tea.—Carl Hartley.

2158. DEUSS, J. J. B. Uitwassching en kalkbemesting. [Leaching and lime fertilizing.] De Thee 1: 107-109. 1920.—The author expresses disapproval of a proposal to dig catch basins in tea gardens to decrease erosion. In the tea regions of West Java the rainfall exceeds evaporation. There is too much tendency to leaching, even soils on limestone being deficient in the lime required for the best development of tea. A system should be used which takes off surplus rainwater, rather than one that retains it.—Carl Hartley.

2159. DEUSS, J. J. B. Zand-, leem- en kleigronden. [Sand, loam, and clay soils.] De Thee 2: 48-50. 1921.—A popular discussion is presented of the distinguishing characters of these soil types. Java tea is mainly grown on loam, the clay soils giving poor results.—Carl Hartley.

2160. GUTHRIE, F. B. **The tick bean as green-manure.** Agric. Gaz. New South Wales 33: 751. 1922.—An analysis of tick bean (*Vicia faba*) grown under irrigation showed that 98 pounds of nitrogen, 26 of phosphoric acid, and 127 of potash are added to each acre of soil when the crop is plowed under green.—*L. R. Waldron.*

2161. HUDIG, J., en C. MEIJER. **De beteekenis van "Tetrafosfaat" als meststof.** [The importance of tetraphosphate as fertilizer.] Verslag. Landbouwk. Onderzoek. Rijkslandbouw-proefsta. 25: 140-159. Pl. 1-8. 1921.—This fertilizer is made from natural phosphates by crushing and heating. From experimental results the following conclusions are drawn: The tetraphosphate functioned best on acid soils but very seldom surpassed superphosphate. Whenever it gave better results it was due to a greater acidity of the soil not favorable for superphosphate. Some acid soils in Netherlands (mostly sand) can be fertilized to advantage with either tetraphosphate or natural phosphates.—*Peter J. Klaphaak.*

2162. KUFFNER, KARL. **Zur Phosphorsäurefrage.** [On the question of phosphoric acid.] Mitteil. Deutsch. Landw. Ges. 37: 512-513. 1922.—The author points out that on some soils, rich in phosphate plants may suffer from phosphate hunger. He gives some data to show that such cases occur when the ratio of magnesium to calcium is wider than 1 to 2.5. When calcium exceeds this proportionate amount the phosphate combines into the insoluble tricalcium phosphate.—*A. J. Pieters.*

2163. LIGTENBERG, J. F. **Grondwaterstand, capillariteit en verdamping.** [Height of ground water, capillarity, and transpiration.] Cultura 34: 262-270. 1922.—A general consideration of the physics of the soil as worked out by Wollny, King, Versluijs, and others is presented. The writer brings together these results as well as his own in connection with the future relation of the IJssel Lake to the height of the ground water of the province of Friesland.—*J. C. Th. Uphof.*

2164. NOSTITZ, A. **Über die Bedeutung des austauschbaren Bodenkalkiums für die Pflanzenernährung.** [The meaning of exchangeable soil potash in plant nutrition.] Jour. Landw. 70: 45-72. 1920.—An experiment with Rothenburger, Bayreuther, and Augsburg soils is reported.—*F. M. Schertz.*

2165. OSUGI, S., and N. SOYAMA. **On the change of soil-reaction by manuring.** Ber. Ohara Inst. Landw. Forsch. 2: 79-93. 1921.—A progress report is made on the effect of various fertilizers on the H-ion concentration of field soils on which barley and rice were grown. The effect of the alkaline reaction of lime, lime-nitrogen, and wood ashes on the barley soil was distinct. The soil from the paddy rice field showed an alkaline reaction which resembled that of the irrigation water.—*H. S. Reed.*

2166. PETIT, A. **A propos du "reveil de la terre arable."** [Concerning the washing of fertile soil.] Compt. Rend. Acad. Sci. Paris 174: 1033-1034. 1922.—A summary is made of an article published by the author in 1909, in which data were presented which have been more recently confirmed by Lumière [see Bot. Absts. 11, Entry 3153]. A beneficial effect upon seed germination is indicated following washing the soil with distilled water.—*C. H. Farr.*

2167. VEIL, C. **Relation entre l'indice de chlore et la teneur en azote de la terre végétale.** [The relation between the index of chlorine and the nitrogen content of the soil.] Compt. Rend. Acad. Sci. Paris 174: 317-319. 1922.—The author reports a study to determine with what precision the nitrogen content of the soil can be determined by the loss of active chlorine from sodium hypochloride. Tests were made with various soils from 5 localities. A soil rich in nitrogen has a high chlorine index. In very rich soils in which the nitrogen content was found to be higher than 0.4 per cent the chlorine index ran higher than 30. In poor soils with a nitrogen content of less than 0.1 per cent, the chlorine index is 7-12. If the nitrogen content is between 0.1 and 0.2 per cent the chlorine index is 15-17.—*C. H. Farr.*

2168. WILLIAMS, C. O. Apparent infertility of the soil around trees. Jour. Dept. Agric. Union South Africa 5: 254-258. 1922.—From experiments carried out to test the moisture content of the soil around trees the conclusion is drawn that the apparent infertility is due to the absorption of the moisture by the ramified roots of the trees.—*L. J. Goldblatt.*

TAXONOMY OF VASCULAR PLANTS

J. M. GREENMAN, *Editor*

E. B. PAYSON, *Assistant Editor*

(See also in this issue Entries 1532, 1599, 1635, 1647, 1652, 1679, 1725, 1749, 1863, 1894, 1909, 1947, 2070)

GENERAL

2169. HAINES, H. H. The botany of Bihar and Orissa. An account of all the known indigenous plants of the province and of the most important or most commonly cultivated exotic ones. Gamopetalae. Part IV. *Small 8vo, p. 419-754.* Adlard & Son & West Newman: London, 1922.—This part follows strictly the plan of previously issued parts of the work and includes the families Rubiaceae to Labiatae, arranged essentially in the sequence of Bentham and Hooker's *Genera Plantarum*. The following apparently new names and combinations are included: *Gardenia gummifera* L.f. var. *gummiferoides*, *Blumea atropurpurea*, *B. lacera* DC. var. *erianthoides*, *Spilanthes acmella* L. var. *typica*, *Sonchus arvensis* L. vars. *typica* and *glaber*, *Lobelia zeylanica* L. var. *aligera* (*L. aligera* Haines), *Mimusops hexandra* Roxb. vars. *typica* and *orizensis*, *Diospyros sylvatica* Roxb. var. *latifolia*, *Carissa paucinervia* A. DC. vars. *opaca* Stapf and *gangetica* Stapf, *C. spinarum* L. vars. *diffusa* and *scandens*, *C. inermis* Vahl var. *Dalzellii*, *Swertia angustifolia* Ham. var. *pyramidalis*, *Hydrolea zeylanica* Vahl vars. *erecta* and *diffusa*, *Ipomoea hastata* (*Merremia hastata* Hallier), *I. caespitosa*, *I. cymosa* R. & S. var. *cochleata*, *I. turpethum* Br. var. *humilior*, *Convolvulus paniculatus* (*Ipomoea paniculata* Burm.), *Datura Stramonium* L. var. *Wallichii* (*D. Wallichii* Dunal), *Limnophila hirsuta* Benth. var. *Clarkei*, *Vandellia crustacea* Benth. var. *verticillata*, *V. brachiata* (*Bonnaya brachiata* Link & Otto), *V. veronicaefolia* (*Bonnaya veronicaefolia* Spreng.), *V. verbenaeefolia* (*Bonnaya verbenaeefolia* Spreng.), *V. oppositifolia* (*Bonnaya oppositifolia* Spreng.), *V. tenuifolia* (*Bonnaya tenuifolia* Spreng.), *Lindernia parviflora* (*Ilysanthes parviflora* Benth.), *L. hyssopioides* (*Ilysanthes hyssopioides* Benth.), *Didissandra lanuginosa* Clarke var. *minuta*, *Tecoma stans* (L.) Juss. var. *apiifolia*, *Stereospermum angustifolium* (*S. chelonoides* var. *angustifolium* Haines), *S. chelonoides* (*Bignonia chelonoides* L. f.), *Dolichandrone falcata* Seem. var. *Lawii* (*D. Lawii* Seem.), *Barleria cristata* L. var. *albida*, *Premna flavesceus* Ham. var. *gmelinoides*, *P. latifolia* Roxb. var. *Gamblei* (*P. integrifolia* Gamble), *Orthosiphon grandiflorus* (*Ocimum grandiflorum* Blume), *Nepeta hindostana* (*Glechoma hindostana* Roth), and *Leucas montana* Spreng. vars. *mollissima*, *pilosa* (*L. pilosa* var. *pubescens* Benth.), and *parvifolia*.—*J. M. Greenman.*

2170. RYDBERG, PER AXEL. Ambrosiaceae. North Amer. Flora 33: 3-44. 1922.—The author treats the genera *Iva*, *Leuciva*, *Oxytenia*, *Chorisiva*, *Cyclachaena*, *Euphrosyne*, *Dicoria*, *Hymenoclea*, *Ambrosia*, *Acanthambrosia*, *Franseria*, and *Xanthium* as a distinct family of the Carduales. Generic and specific characterizations are given together with a complete citation of synonymy, statement of the type locality, and distribution of the species. The following new genera, new combinations, and new species occur: *Leuciva* n. gen. *L. dealbata* (*Iva dealbata* Gray), *Chorisiva* n. gen., *C. nevadensis* (*Iva nevadensis* M. E. Jones), *Cyclachaena pedicellata*, *C. lobata*, *Dicoria oblongifolia*, *D. hispidula*, *Hymenoclea pentalepis*, *Ambrosia monophylla* (*Iva monophylla* Walt.), *A. diversifolia* (*A. artemisiifolia diversifolia* Piper), *A. Rugelii*, *A. californica*, *Acanthambrosia* n. gen., *A. Bryantii* (*Franseria Bryantii* Curran), *Franseria Palmeri*, *F. villosa* (*F. bipinnatifida villosa* Eastw.), *F. linearis* (*Gaertneria linearis* Rydb.), *F. canescens* (*Ambrosia fruticosa* var. *canescens* Benth.), *F. strigulosa*, *F. confertiflora* (*Ambrosia confertiflora* DC.), *F. Pringlei*, *F. caudata*, *F. hispidissima*, *F. incana*, *F. leptophylla* (*F. camphorata* var. *leptophylla* Gray), *F. intricata*, *F. malvacea*, *F. Sanctae-Gertrudis*, and *F. lancifolia*.—*E. B. Payson.*

2171. RYDBERG, PER AXEL. *Carduaceae*. North Amer. Flora 33: 45-46. 1922.—In the present part of volume 33 Rydberg commences the treatment of the family *Carduaceae* with a characterization of the family as a whole and the presentation of a key to the 17 tribes into which he separates the family. The first tribe, the *Vernonieae*, is elaborated by GLEASON.—E. B. Payson.

PTERIDOPHYTES

2172. DEAM, C. C. Is *Botrychum dissectum* a sterile mutant? Amer. Fern Jour. 11: 114. March 31, 1922.

2173. FERNALD, M. L. *Polypodium virginianum* and *P. vulgare*. Rhodora 24: 125-142. 1922.—Detailed study of the American plants leads to the conclusion that the plant of eastern America which has long passed as *Polypodium vulgare* is a distinct species, *P. virginianum* L., which reappears in eastern Asia, while the plants of the Pacific slope which have been known as *P. californicum* Kaulf., *P. intermedium* Hook. & Arn., *P. falcatum* Kellogg, and *P. hesperium* Maxon are an intergradient series with all the specific characters of the European *P. vulgare*. The following new names occur: *P. vulgare* var. *intermedium* (Hook. & Arn.) n. comb. based on *P. intermedium* Hook. & Arn., var. *intermedium* forma *projectum* n. f., var. *Kaulfussii* (D. C. Eaton) n. comb. based on *P. californicum* var. *Kaulfussii* D. C. Eaton; and under *P. virginianum* forma *acuminatum* (Gilbert) n. comb. based on *P. vulgare acuminatum* Gilbert, forma *elongatum* (Jewell) n. comb. based on *P. vulgare* forma *elongatum* Jewell, forma *brachypterum* (Ridlon) n. comb. based on *P. vulgare* forma *brachypterum* Ridlon, forma *subsimplex* n. f., forma *deltoideum* (Gilbert) n. comb. based on *P. vulgare* forma *deltoideum* Gilbert, forma *bipinnatifidum* n. f., forma *chondroides* n. nom. for *P. vulgare* var. *bifido-multifidum* Gilbert not Drury, forma *alato-multifidum* (Gilbert) n. comb. based on *P. vulgare* var. *alato-multifidum* Gilbert, and forma *Churchiae* (Gilbert) n. comb. based on *P. vulgare* var. *Churchiae* Gilbert.—M. L. Fernald.

2174. HOPKINS, L. S. Is *Botrychum dissectum* a sterile mutant? Amer. Fern Jour. 11: 114-116. March 31, 1922.

2175. MAXON, WILLIAM R. Notes on American ferns—XVIII. Amer. Fern Jour. 11: 105-107. March 31, 1922.—Range is extended for 4 species; and a note is given on the reported hybrid between *Polystichum acrostichoides* (Michx.) Schott and *Dryopteris cristata* (L.) Gray, which seems to be only an extreme form of *Polystichum acrostichoides* (Michx.) Schott.—F. C. Anderson.

2176. MAXON, WILLIAM R. Studies of tropical American ferns—No. 7. Contrib. U. S. Nation. Herb. 24: 33-63. Pl. 11-20. 1922.—This paper consists of studies of various small groups of tropical American ferns. A revision of the North American species of *Alsophila* grouped with *A. armata* contains a key to 13 species, with full descriptions and synonymy. *A. strigillosa* (Cuba), *A. notabilis* (Cocos Island), *A. pansamalana* (Guatemala), *A. nesiotica* (Cocos Island), and *A. trichiata* (Costa Rica and Panama) are new. A new *Alsophila*, *A. Williamsii* from Panama, of another group, is also described. The following new names and new species appear under *Dicranopteris*: *D. affinis* (Mett.), *D. Brittonii* (from Trinidad), *D. gracilis* (Mart.), *D. longipes* (Fée), *D. longipinnata* (Hook.), *D. maritima* (Hieron.), *D. nervosa* (Kaulf.), *D. nuda* (Moritz), *D. pennigera* (Mart.), *D. pruinosa* (Mart.), *D. remota* (Kaulf.), *D. rubiginosa* (Mett.), *D. simplex* (Desv.), *D. velata* (Kunze), *D. yungensis* (Rosenst.). A key to the 4 species of *Cheilanthes* known from Jamaica is given. Two, *C. Harrisii* and *C. jamaicensis*, are new. *Polystichum deminuens*, from Cuba, and *P. Killipii*, from Jamaica, are described as new. *Atalopteris* Maxon & C. Chr. n. gen., based on 2 species heretofore referred to *Psomiocarpa*, is described and discussed, and a key is given to the 2 known species, *A. aspidioides* (Griseb.) Maxon & C. Chr., from Cuba, and *A. Maxoni* (Christ) C. Chr., from Jamaica. Three new species of the subgenus *Stigmatopteris* of *Dryopteris* are described: *D. nothochlaena*, from Jamaica, *D. hemiptera*, from Cuba, and *D. sordida*, from Guatemala.

Under miscellaneous notes, various range extensions are listed, and new combinations and names are made as follows: *Pityrogramma schizophylla* (Baker), *P. Eggersii* (Christ), and *Dryopteris anceps* (*Acrostichum Fendleri* Baker) . . . Ten of the species described in this paper are illustrated by photographic plates.—*S. F. Blake*.

2177. WEATHERBY, C. A. The group of *Polypodium lanceolatum* in North America. Contrib. Gray Herb. 65: 3-14. 1922.—As here understood *P. lanceolatum* is a species of wide distribution in tropical regions of America, Africa, and India and in its main distinguishing characters it is constant enough throughout its range, but in certain other characters, notably those of the scales of the rootstalk, it varies considerably. The most readily recognizable of these variants occur in Mexico and Central America and it is these divergent forms which are considered in the present paper. A key is given to the several species and varieties of this group and synonyms and exsiccatae are freely cited. The following new species and varieties and new combinations are described: *P. lanceolatum* L. var. *complanatum*, *P. lanceolatum* L. var. *crassinervatum* (*Drynaria crassinervatum* Fée), *P. lanceolatum* L. var. *tricophorum*, *P. erythrolepis*, *P. Conzatti*, *P. fruticosum* Maxon & Weatherby, *P. panamense*.—*E. B. Payson*.

SPERMATOPHYTES

2178. AMES, O. Descriptions of new orchids from tropical America with nomenclatorial changes. Proc. Biol. Soc. Washington 35: 81-88. 1922.—*Aa Rosei*, *Bletia Nelsonii*, *Malaxis mexicana*, *M. Rosei*, *M. tepicana*, *Pelexia Mazonii*, *Platystele compacta*, *Pleurothallis palliolata*, and *Stelis Johnsonii* are described as new species. The following new combinations are made: *Malaxis acianthoides* (*Microstylis acianthoides* Schltr.), *Malaxis blephariglottis* (*Microstylis blephariglottis* Schltr.), *Malaxis brachyrrhyncha* (*Microstylis brachyrrhyncha* Reichb. f.), *Malaxis Javesiae* (*Microstylis Javesiae* Reichb. f.), *Malaxis lepanthiflora* (*Microstylis lepanthiflora* Schltr.), *Malaxis lepidota* (*Microstylis lepidota* Finet), *Malaxis linguella* (*Microstylis linguella* Reichb. f.), *Malaxis minutiflora* (*Microstylis minutiflora* Schltr.), *Malaxis monticola* (*Microstylis monticola* Schltr.), *Malaxis ocreata* (*Microstylis ocreata* S. Wats.), *Malaxis pandurata* (*Microstylis pandurata* Schltr.), *Malaxis Pittieri* (*Microstylis Pittieri* Schltr.), *Malaxis platyglossa* (*Microstylis platyglossa* Robins. & Greenm.), *Malaxis Pringlei* (*Microstylis Pringlei* S. Wats.), *Malaxis streptopetala* (*Microstylis streptopetala* Robins. & Greenm.), *Malaxis tenuis* (*Microstylis tenuis* S. Wats.), *Malaxis Tonduzii* (*Microstylis Tonduzii* Schltr.), *Malaxis Tuerckheimii* (*Microstylis Tuerckheimii* Schltr.), *Malaxis Wercklei* (*Microstylis Wercklei* Schltr.).—*J. C. Gilman*.

2179. ASHE, W. W. Notes on trees and shrubs of southeastern North America. Rhodora 24: 77-79. 1922.—The range of *Viburnum densiflorum* Chapm. is extended from Alabama into Newton County, Texas, and of *Quercus hybrida* (Chapm.) Small from Mississippi into Newton County; *Quercus obtusa* (Willd.) Ashe is maintained as a coastal plain species distinct from *Q. laurifolia* Michx. The following are new: *Quercus arenicola* n. nom., based on *Q. hybrida* (Chapm.) Small (1903), not Bechst. (1829); *Q. arenicola integra* n. var.; *Q. obtusa obovatifolia* (Sargent) n. comb., based on *Q. rhombica* var. *obovatifolia* Sargent; *Q. moultonensis* n. nom., based on *Q. hybrida* Houba (1887), not Bechst. (1829); *Q. nigra heterophylla* n. comb., based on *Q. aquatica* var. Ait., and *Acer barbatum sinuosum* (Rehder) n. comb., based on *A. sinuosum* Rehder.—*M. L. Fernald*.

2180. ASHE, W. W. Notes on the trees and shrubs of the southeastern United States. Bull. Torrey Bot. Club 49: 265-268. 1922.—The following are published: *Castanea pumila* *Margaretta* var. nov., *C. floridana* (Sarg.) comb. nov., *C. Ashei* (Sudworth) comb. nov., *Quercus coloradensis* hybr. nov. (*Q. virginiana* Mill. \times *Q. macrocarpa* Michx.), *Q. nigra elongata* comb. nov., *Malus elongata pubens* var. nov., and *M. platycarpa parrula* var. nov. A key is given to the *Castanea pumila* group.—*P. A. Munz*.

2181. BARTLETT, H. H. Color types of *Corallorrhiza maculata* Raf. Rhodora 24: 145-148. 1922.—Three color types from Michigan are described and designated *Corallorrhiza maculata* var. *flavida* (Peck) n. comb., based on *C. multiflora flavida* Peck, var. *fusca* n. var., and var. *punicea* n. var.—*M. L. Fernald*.

2182. BLAKE, S. F. **New Asteraceae from Utah and Nevada.** Proc. Biol. Soc. Washington 35: 173-178. 1922.—*Chrysopsis viscida cinerascens*, *Aster glaucodes pulcher*, *Erigeron caespitosus anactis*, and *Tetradymia comosa tetrameres* are described as new subspecies. *Aplopappus brickelliioides*, *Aster bellus*, *Bahia ourolepis*, and *Ptiloria cinerea* are described as new species.—J. C. Gilman.

2183. BLAKE, S. F. **New plants from South and Central America collected by Wilson Popenoe.** Proc. Biol. Soc. Washington 35: 117-124. 1922.—*Tibouchina asperipilis*, *Centronia tunguraguae*, *Gaultheria pubiflora*, *Disterigma margaricoccum*, *D. Popenoei*, *Macleania irazuensis*, *M. laurina*, *M. Popenoei*, and *Citharexylum subflavescens* are described as new species.—J. C. Gilman.

2184. BLAKE, S. F. **The identity of the genus Adventina Raf.** Rhodora 24: 34-36. 1922.—Rafinesque's *Adventina* (1836) proves to be identical with *Galinsoga* Cav. (1794) and his *Adventina ciliata* forms the basis of *Galinsoga ciliata* (Raf.) n. comb., which is identical with *G. aristulata* Bicknell (1916). Rafinesque's account furnished the first records of either *G. aristulata* or *G. parviflora* in the U. S. A.—M. L. Fernald.

2185. BLAKE, S. F. **Two new species of Moraceae from South America.** Proc. Biol. Soc. Washington 35: 179-180. 1922.—The species described are *Brosimum columbianum* and *Brosimopsis diandra*.—J. C. Gilman.

2186. BRITTON, N. L., and J. N. ROSE. **Two new genera of Cactaceae.** Bull. Torrey Bot. Club 49: 251-252. 1922.—*Thelocactus* (Schumann), formerly a subgenus under *Echinocactus*, is raised to generic rank; *Neolloydia* gen. nov. is published. The following new combinations are made: *Thelocactus hexaedrophorus* (Lemaire), *T. bicolor* (Galeotti), *T. lophothele* (Salm-Dyck), *Neolloydia conoidea* (De Candolle), and *N. Beguinii* (Weber). The first named species under each genus is the type species.—P. A. Munz.

2187. ENGLER, A. **Additamentum ad Araceas-Philodendroideas.** Das Pflanzenreich Heft 71 (IV. 23E). 2* p. 1920.—This is a short supplement to Engler and Kraus Araceae-Philodendroideae-Philodendreae, Das Pflanzenreich Heft 55 (IV. 23Da), 1912, and concerns primarily the genera *Ariarum* and *Piptospatha*. One new combination is included, namely, *Piptospatha perakensis* (*P. elongata* N. E. Brown var. *perakensis* Engler, *Rhynchophyle perakensis* Ridley).—J. M. Greenman.

2188. ENGLER, A., und K. KRAUSE. **Araceae-Colocasioideae.** Das Pflanzenreich Heft 71 (IV. 23E). 139 p., 29 fig. 1920.—Three tribes are included in the subfamily treated in the present part, namely, *Colocasieae*, *Syngonieae*, and *Ariopsidaeae*. These tribes embrace 15 tropical genera of which the largest and best known are *Alocasia*, *Xanthosma*, *Caladium*, and *Synгонium*. The following new species, varieties, and combinations are included; and the authorship, unless otherwise indicated, should be attributed to Engler: *Steudefneria Henryana*; *S. Gagei* Krause; *Gonatanthus pumilius* Engl. & Krause (*Caladium pumilum* D. Don); *Caladium angustifolium*; *C. Schomburgkii* Schott vars. *venosum* (*C. venosum* N. E. Brown) and *rubescens* (*C. rubescens* N. E. Brown); *C. bicolor* (Ait.) Vent. vars. *surinamense* (*C. surinamense* Miq.), *bohemium* (*C. bohemium* Hort.), and *roseo-maculatum*; *C. picturatum* C. Koch vars. *adaman-tinum* (*C. adamantinum* L. Lind.) and *sagittatum* (*C. sagittatum* L. Lind. & Rodig.); *Xanthosma atrovirens* C. Koch vars. *Kochii*, *Moritzii* (*X. atrovirens* C. Koch & Bouché var. *versicolor* C. Koch), and *panduriforme*; *X. Ulei*; *X. mafaffa* Schott var. *typicum*; *X. belophyllum* (Willd.) Kunth var. *Kunthii*; *X. obtusilobum*; *X. Buchtienii*; *X. Riedelianum* Schott var. *brancoanum*; *X. Eggersii* (*Caladium Eggersii* Engl.); *X. brasiliense* (*Caladium brasiliense* Desf.) and *Weberbaueri*; *Colocasia antiquorum* Schott var. *globulifera* Engl. & Krause; *Alocasia Merrillii* Engl. & Krause; *A. atropurpurea*; *A. Gageana* Engl. & Krause; *A. crassinervia*; *A. crassifolia*; *A. inornata* Hallier f.; *A. indica* (Roxb.) Schott vars. *typica*, *violacea*, and *diversifolia* (*A. indica* var. *hetero-*

phylla (Schott) Engl.); *A. Lecomtei*; *A. tonkinensis*; *A. hainanensis* Krause; *A. grata* Prain; *A. denudata* Engl. var. *elongata*; *A. Uhinkii* Hort. (*A. macrorrhiza* × *indica* var. *metallica*); *A. Leopoldi* Hort. (? *A. indica* × *Sanderiana*); *A. splendens* (Hort.) Linden (? *A. indica* × *Sanderiana*); *A. subodora* Engl. & Krause (*A. odora* × *argyrea*); *Schizocasia acuta* Engl. var. *typica*; *Syngonium Rothschildianum*; *S. Vellozianum* Schott var. *oblongisectum*; *S. macrophyllum*; *S. amazonicum*; *S. podophyllum* Schott vars. *Oerstedianum* (*S. Oerstedianum* Schott), *multi-sectum*, and *albolineatum* (*S. albolineatum* Hort.).—J. M. Greenman.

2189. FASSETT, NORMAN C. *Lophotocarpus* on the northeastern river-estuaries. *Rhodora* 24: 71-73. Pl. 137. 1922.—*Lophotocarpus calycinus* (Engelm.) J. G. Smith, a southern species, has well developed sagittate leafblades; while the more northern *L. spongiosus* (Engelm.) J. G. Smith, a plant confined to estuaries from the Delaware River to the Gulf of St. Lawrence, has the blades commonly obsolete. No differences are found in the fruit and study of a large series of specimens demonstrates that where their ranges are coincident the 2 plants intergrade but northward the sagittate blades become progressively rarer until the more northern colonies bear only phyllodia. The new combination, *L. calycinus* var. *spongiosus* (Engelm.) Fassett, is made—M. L. Fernald.

2190. FERNALD, M. L. *Brassica arvensis* (L.) Kuntze, var. *Schkuhriana* (Reichenb.) n. comb. *Rhodora* 24: 36. 1922.—The transfer is based on *Sinapis Schkuhriana* Reichenb. (1837-38).—M. L. Fernald.

2191. FERNALD, M. L. *Lysimachia terrestris* (L.) BSP., var. *ovata* (Rand and Redfield), n. comb. *Rhodora* 24: 76. 1922.—The new combination is based on *L. stricta* var. *ovata* Rand & Redfield (1894).—M. L. Fernald.

2192. FERNALD, M. L. Notes on *Sparganium*. *Rhodora* 24: 26-34. 1922.—Notes are given on the identity and geographic distribution of critical American species, with key to the species of eastern North America. The following are recognized: *S. eurycarpum* Engelm., *S. androcladum* (Engelm.) Morong (*S. lucidum* Fernald & Eames), *S. americanum* Nutt., *S. chlorocarpum* Rydberg (*S. diversifolium* of American authors), *S. chlorocarpum* var. *acaule* (Beeby) n. comb., *S. angustifolium* Michx. (*S. affine* Schnitzl.), *S. fluctuans* (Morong) Robinson, *S. minimum* Fries, and *S. hyperboreum* Laestad.—M. L. Fernald.

2193. FERNALD, M. L. Some variations of *Cakile edentula*. *Rhodora* 24: 21-23. 1922.—The author divides the species into var. *typica* (Iceland and Labrador to South Carolina; Azores), var. *lacustris* n. var. (strands of the Great Lakes), and var. *californica* (Heller) n. comb. (*C. californica* Heller, British Columbia to California).—M. L. Fernald.

2194. FERNALD, M. L. The American variations of *Linnaea borealis*. *Rhodora* 24: 210-212. 1922.—The author recognizes in America: typical *L. borealis* L. (*L. serpyllifolia* Rydb.) in Alaska; var. *americana* (Forbes) Rehder, Greenland and Labrador to Alaska and south to the northern and upland states; var. *longiflora* Torr., British Columbia to northern California.—M. L. Fernald.

2195. FERNALD, M. L. The generic name *Phragmites*. *Rhodora* 24: 55-56. 1922.—The author discusses the names *Phragmites* and *Trichoon* Roth (1798), the latter taken up by some European authors as antedating *Phragmites* Trin. (1820). The latter name, however, dates from Adanson (1763) and should be retained.—M. L. Fernald.

2196. FERNALD, M. L., and C. A. WEATHERBY. Varieties of *Geum canadense*. *Rhodora* 24: 47-50. 1922.—Besides typical *G. canadense* the following are recognized: forma *glandulosum* n. f., var. *texanum* n. var., var. *camporum* (Rydberg) n. comb. (*G. camporum* Rydberg), var. *camporum* f. *adenophorum* n. f., var. *Grimesii* n. var.—M. L. Fernald.

2197. GLEASON, HENRY ALLEN. *Vernonieae*. North Amer. Flora 33: 47-110. 1922.—As the first tribe of the *Carduaceae* the author presents a complete treatment of the 19 recognized genera of this tribe. Of these 19 genera *Vernonia* is the largest with 123 species. Keys to the genera and species are given as well as a complete citation of synonymy, statement of type localities, distribution, and illustrations. The following new species and new combinations are included: *Centratherum violaceum* (*Spiria violacea* Schrank), *Vernonia callilepis*, *Eremosis oolepis* (*Vernonia oolepis* Blake), *E. angusta*, *E. callilepis* (*Vernonia Steetzii* var. *callilepis* Schz. Bip.), *E. obtusa*, *E. littoralis* (*Vernonia littoralis* Brand.), *Oliganthes ferruginea*.—E. B. Payson.

2198. HOEHNE, F. C. *Melastomáceas dos Hervários: Horto "Oswaldo Cruz," Museu Paulista, Comissão de Linhas Telegráficas Estratégicas de Mato-Grosso ao Amazonas, Jardim Botânico do Rio de Janeiro, etc.* [Melastomaceae of the herbaria of the Horto "Oswaldo Cruz," Paulista Museum, Commission of the strategic telegraph lines of Mato-Grosso on the Amazon, of the Botanical Garden of Rio de Janeiro, etc.] Anexos Mem. Inst. Butantan [Bot.] 15: 1-198. Pl. 1-21, and frontispiece. 1922.—The Melastomaceae represented in the various herbaria mentioned are treated in detail with brief descriptions, critical notes, and the citation of specimens for each species. The following species and varieties are described as new: *Microlicia Warmingiana* Cgn. var. *glandulosa*, *M. insignioides*, *M. insignioides* var. *gracilis*, *M. suborbicularifolia*, *M. sulfurea*, *M. Bradeana*, *Lavoisiera itabirana*, *Rhynchanthera spicata*, *R. corumbaensis*, *R. cacerensis*, *R. linearifolia*, *R. corinnensis*, *Poteranthera genliseoides*, *Acisanthera bracteosa* (*Comolia bracteosa* Huber), *Macairea villosa*, *M. goyazensis*, *Tibouchina paulistana*, *T. Valtherii* Cgn. var. *minor*, *T. urceolaris* Cgn. var. *papillosa*, *T. rupicola*, *Comolia affinis*, *C. Kuhlmannii*, *Leandra purpureo-villosa*, *L. xantholasia* Cgn. var. *setulosa*, *L. cardiophylla* Cgn. var. *integra*, *L. aurea* Cgn. var. *aggregatiflora*, *L. sparsisetulosa*, *L. hirtella* Cgn. var. *Löfgrenii*, *L. pauloensis*, *Miconia nambyquarae*, *M. Camposnovaesii*, *M. rubiginosa* DC. var. *Kuhlmannii*, *M. cubatanensis*, *M. petropolitana* Cgn. var. *macrophylla*, *M. matlogrossensis*, *M. theaezans* Cgn. var. *setulosa*, *Tococa Kuhlmannii*, *Clidemia cubatanensis*, *C. Kuhlmannii*, *C. longisetosa*, *C. rubra* Mart. var. *ursina*, *C. pussiliflora*, *Henriettella Duckeana*, *Ossaea Duckeana*, *Topobea rupicola*, *Mouriria pusa* Gardn. var. *grandifolia*.—E. B. Payson.

2199. INMAN, O. L. *Calamagrostis canadensis* and some related species. *Rhodora* 24: 142-144. 1922.—The author gives a key to and synonymy of *Calamagrostis Macouniana* Vasey, *C. canadensis* (Michx.) Nutt., *C. canadensis* var. *robusta* Vasey, *C. canadensis* var. *Langsdorfi* (Link) n. comb. based on *Arundo Langsdorfi* Link, *C. blanda* Beal, *C. perplexa* Scribn., *C. Porteri* Gray, and *C. Scribneri* Beal.—M. L. Fernald.

2200. KRAUSE, K., e F. C. HOEHNE. *Contribuições ao conhecimento das Rubiaceas do Brasil meridional*. [Contributions to the knowledge of the Rubiaceae of southern Brazil.] Anexos Mem. Inst. Butantan [Bot.] 15: 1-33. Pl. 1-6. 1922.—Many Rubiaceae species of southern Brazil are listed with notes as to their distribution, habits of growth, and common names. The following species are described as new by K. Krause: *Coccocypselum cordatum*, *Psychotria florestana*, *P. Hoehnei*, *Palicourea Hoehnei*, *Famea Hoehnei*, *Richarsonia acutifolia*.—E. B. Payson.

2201. LINDER, D. H. Some varieties of *Panicum virgatum*. *Rhodora* 24: 11-16. Fig. 1-6. 1922.—The following varieties are discussed: var. *cubense* Griseb., var. *scortum* n. var. from Bermuda, var. *thyrsiforme* n. var. from Florida and Mississippi; var. *spissum* n. var. from Nova Scotia to New Jersey and central New York.—M. L. Fernald.

2202. LINGELSHEIM, A. *Oleaceae-Oleoideae-Fraxineae und Oleaceae-Oleoideae-Syringaeae*. Das Pflanzenreich Heft 72 (IV. 243 i u. ii). 125 p., 22 fig., 1 map. 1920.—Two genera are included in the tribe *Fraxineae*, namely, *Fontanesia* and *Fraxinus*. The former has but a single species, *Fontanesia phillyreoides* Labill., with varieties *mediterranea* (F. phillyreoides C. K. Schneider) of the Mediterranean region and *Fortunei* (Carr.) Koehne of

China. *Fraxinus* includes 64 recognized species and numerous varieties. The following new species, varieties, and combinations are recorded: *Fraxinus ornus* L. vars. *typica* Lingelsh. and *sanguinea* Hausmann & Lingelsh., *F. Pariana* Lingelsh. var. *depauperata*, *F. retusa* Champ. vars. *typica* and *integra*, *F. fallax*, *F. stylosa*, *F. longicuspis* Sieb. & Zucc. var. *Sieboldiana* (Blume), *F. chinensis* Roxb. vars. *typica*, *rotundata*, *tomentosa*, and *acummata*, *F. yunnanensis* (*F. velutina* Lingelsh., not Torr.), *F. dipetala* Hook. & Arn. var. *typica*, *F. Schiedeana* Schlecht. & Cham. vars. *typica* and *palmarum*, *F. Jonesii*, *F. xanthoxyloides* Wall. var. *dimorpha* (Coss. & Dur.), *F. americana* L. var. *albicans* (Buckl.), *F. pennsylvanica* Marsh. var. *pubescens* (Lam.), *F. Rehderiana*, *F. oregona* Nutt. vars. *latifolia* (Benth.) and *glabra*, *F. velutina* Torr. vars. *typica*, *glabrata*, and *coriacea* (Wats.), *F. lanceolata* Borkh. vars. *viridis* (Michx.), *macrocarpa*, and *Lindheimeri* (Wenzig), *F. Uhdei* (Wenzig) Lingelsh. vars. *typica* and *pseudoperiptera*, *F. caroliniana* Mill. vars. *platycarpa* (Michx.) and *cubensis* (Griseb.), *F. elbursensis*, *F. syriaca* Boiss. var. *persica* (Boiss.), *F. oxycarpa* Willd. vars. *oxyphylla* (Marsch. Bieb.), *angustifolia* (Vahl), *algeriensis*, *australis* (Gay), *macrocarpa*, and *tamariscifolia* (Vahl), *F. Bornmülleri*, *F. Brandisii*, and *F. nigra* Marsh. vars. *sambucifolia* (Lam.) and *mandschurica* (Rupr.). Two new hybrids are also recorded, namely, *F. americana* × *pennsylvanica* (*F. Biltmoreana* Beadle) and *F. lanceolata* × *pennsylvanica* (*F. cinerea* Bosc.). A map accompanies the text, which shows the geographical distribution of *Fraxinus*. The tribe *Syringaeae* embraces 3 genera, namely, *Syringa*, *Schrebera*, and *Forsythia*. These genera, on account of the long corolla-tube, dehiscence of capsule, and winged seeds, constitute a natural group; their center of geographical distribution is in central Asia. The following new species, varieties, and combinations are recorded: *Syringa villosa* Vahl var. *Limprichtii*, *S. glabra* (*S. villosa* var. *glabra* C. K. Schneider), *S. Schneideri* (*S. Dielsiana* Schneider, in part), *S. oblata* Lindl. vars. *typica* and *affinis* (*S. affinis* Henry), *S. persica* L. vars. *typica* and *coriacea*, *S. amurensis* Rupr. var. *rotundifolia* (Decne.), *Schrebera Schellenbergii*, *S. excelsa* with vars. *typica* and *somnifera*, *S. Nyassae*, *S. Gilgiana*, and *Forsythia suspensa* (Thunb.) Vahl var. *pubescens* (Rehder).—J. M. Greenman.

2203. MACBRIDE, J. FRANCIS. A revision of *Astragalus*, subgenus *Homalobus*, in the Rocky Mountains. Contrib. Gray Herb. 65: 28–39. 1922.—The author treats the species of this group from the same range as is included in Rydberg's Flora of the Rocky Mountains and Adjacent Plains, but recognizes only 26 species instead of the 45 maintained by Rydberg under *Homalobus* as a distinct genus. A dichotomous key is presented for the species and varieties treated. Specimens are cited for each species and variety and synonyms are freely included. The following new names, varieties, and forms occur: *Astragalus tenellus* Pursh forma *strigulosus* (*Homalobus strigulosus* Rydb.), *A. tenellus* Pursh var. *Clementis* (*Homalobus Clementis* Rydb.), *A. tenellus* Pursh forma *acerbus* (*A. acerbus* Sheld.), *A. campestris* (Nutt.) Gray var. *diversifolius* (*A. diversifolius* Gray), *A. Garrettii* (*Homalobus paucijugus* Rydb.), *A. Carletonii* (*Homalobus humilis* Rydb.), *A. hylophilus* (Rydb.) A. Nels. var. *oblongifolius* (*Homalobus oblongifolius* Rydb.), *A. Rydbergii* (*Homalobus decurrens* Rydb.) *A. serotinus* Gray var. *strigosus* (*A. strigosus* Coult. & Fish.), *A. serotinus* Gray var. *Palliseri* (*A. Palliseri* Gray), *A. curvicaupus* (*A. speiroparpus* Gray var. *curvicaupus* Sheld.).—E. B. Payson.

2204. MACBRIDE, J. FRANCIS. Notes on certain Leguminosae of the tribe Psoraleae. Contrib. Gray Herb. 65: 14–23. 1922.—The following new species and varieties as well as new names and combinations are given: *Psoralea tenuiflora* Pursh var. *Bigelovii* (*Psoralidium Bigelovii* Rydb.), *P. scaposa* (*P. hypogaea* Nutt. var. *scaposa* Gray), *P. humilis* (*Pedimelum humile* Rydb.), *P. macrostachya* DC. var. *longiloba* (*Holita longiloba* Rydb.), *P. arosela* Benth. (*Dalea Benthani* Brandg.), *P. megacarpa* (*Dalea megacarpa* Wats.), *P. Fremontii* (Torr.) Vail var. *Wheeleri* Robinson (*P. Wheeleri* Vail), *P. Fremontii* (Torr.) Vail var. *Saundersii* (*Dalea Saundersii* Pursh), *P. tinctoria* (*Dalea tinctoria* Brandg.), *P. mollis* (Benth.), Heller var. *neo-mexicana* (*Dalea mollis* Benth. var. ? *neo-mexicana* Gray), *P. laxiflora* (*Dalea laxiflora* Schlecht.), *P. leporina* (Ait.) Rydb. var. *alba* (*Dalea alba* Michx.), *P. leporina* (Ait.) Rydb. var. *Thouini* (*Dalea Thouini* Schrank), *P. vernicia* Rose var. *citrina* (*P. citrina* Rydb.), *P. tomentosa* (Cav.) Rose var. *psoraleoides* (*Dalea psoraleoides* Moric.), *P. polycephala* (Benth.)

Rydb. var. *minutifolia* (*P. minutifolia* Rydb.), *P. triphylla* (*Dalea triphylla* Sessé & Moc.), *P. versicolor* (Zucc.) Rydb. var. *tsugoides* (*P. tsugoides* Rydb.), *P. Wislizeni* (Gray) Vail var. *Sanctae-Crucis* (*P. Sanctae-Crucis* Rydb.), *P. lasiostachya* (Benth.) Rose var. *glabrescens* (*P. glabrescens* Rydb.), *P. lasiostachya* (Benth.) Rose var. *involuta* (*P. involuta* Rydb.), *P. lutea* Cav. var. *caudata* (*P. caudata* Rydb.), *P. Arsenei*, *P. Dalea* (L.) Britton var. *robusta* (*Thornbera robusta* Rydb.), *P. pumila* (*Thornbera pumila* Rydb.), *P. tenuicaulis* (*Dalea tenuicaulis* Hook. f.), *P. pazensis* (*Dalea pazensis* Rusby), *P. parvifolia* (*Dalea parvifolia* Hook. f.), *P. multifoliolata* (*Psoralea multifoliolata* Clos), *P. humifusa* (*Dalea humifusa* Benth.), *P. cylindrica* (*Dalea cylindrica* Hook.), *P. coerulea* (*Galega coerulea* L. f.), *P. calliantha* (*Dalea calliantha* Ulbrich), and *P. boliviana* (*Dalea boliviana* Britton). A key is given to the species closely related to *Parosela microphylla*.—E. B. Payson.

2205. MACBRIDE, J. FRANCIS. Various North American spermatophytes, new or transferred. Contrib. Gray Herb. 65: 39-46. 1922.—The following new species, varieties, new combinations, and new names are given: *Cleome lutea* Hook. var. *Jonesii*, *Lotus Torreyi* (Gray) Greene var. *seorsus*, *Mentzelia laevicaulis* (Dougl.) T. & G. var. *acuminata* Nels. & Macbride (*Nuttallia acuminata* Rydb.), *M. parviflora* (*Bartonia parviflora* Dougl.), *Opuntia compressa* (*Cactus compressus* Salisb.), *Oenothera Abramsi*, *O. erythra* (*Sphaerostigma erythra* Davidson), *Gomphocarpus Torreyi*, *G. Torreyi* var. *Xanti* (*G. tomentosus* (Torr.) Gray var. *Xanti* Gray), *Phacelia viscida* (Benth.) Torr. forma *albiflora* (*Eutoca albiflora* Nutt.), *Allocarya stipitata* Greene var. *micrantha* (*A. stipitata* Greene subsp. *micrantha* Piper), *Solanum Xanti* Gray var. *Spenceriae*, *Castilleja Douglasii* Benth. var. *contentiosa*, *Lepachys columnifera* (*Rudbeckia columnifera* Nutt.), *Stephanomeria Wheeleri* (*Chaetadelphia Wheeleri* Gray).—E. B. Payson.

2206. MAIDEN, J. H. A critical revision of the genus *Eucalyptus*. Vol. VI, Part 4. pp. 165-218, pl. 220-223. John Spence: Sydney, July 1922.—In this number the author continues his discussion of hybrids, and adds a 3rd chapter on timber. Two hybrids between *Eucalyptus sideroxylon* A. Cunn. and *E. leucoxylon* F. v. M. are recorded. A 3rd new hybrid \times *E. mcintyrensis* from Mount McIntyre, South Australia, is characterized. Under the caption "Fossil plants attributed to *Eucalyptus*" a brief résumé of the subject is given and the following fossil plants, found in Australia and Tasmania, although previously published, are here redescribed and illustrated: *Eucalyptus Pluti* McCoy, *E. Kayseri* and *E. Milligani* Johnston; *E. Delftii*, *E. Diemenii*, *E. Hayi*, *E. Houtmanni*, *E. Mitchellii*, *E. cretacea*, *E. Davidsoni*, *E. oxleyana*, *E. scoliophylla*, and *E. Warraghiana* Ettingshausen; *E. praecoriacea*, *E. Hermani*, *E. Howitti*, *E. Kitsoni*, *E. Suttoni* (*E. Muelleri* Deane), and *E. Chapmani* Deane (*E. Woollsi* Deane).—J. M. Greenman.

2207. MERRILL, E. D. New or noteworthy Philippine plants, XVII. Philippine Jour. Sci. 20: 367-476. 1922.—One hundred six new species are described, while certain changes in nomenclature are proposed, the most important of which is the acceptance of *Polychroa* Lour. (1790) in place of *Pellionia* Gaudich. (1826). The proposed new species are as follows: *Ficus Xavieri*, *F. kalingaensis*, *Elatostema bontocense*, *E. capizense*, *E. Edañoi*, *E. euphlebium*, *E. kalingaense*, *E. lignosum*, *E. samarense*, *Pipturus angustifolius*, *Polychroa multinervia*, *P. ferruginea*, *Pycnarrhena membranifolia*, *Goniotalamus punctifolius*, *Cryptocarya Edañoi*, *C. cagayanensis*, *Rubus perfulvus*, *R. heterosepalus*, *Cassia mindanaensis*, *Mucuna foveolata*, *M. samarensis*, *Evodia confusa*, *Aglaia cupreo-lepidota*, *Dichapetalum euphlebium*, *Croton lancilimbus*, *Trigonostemon angustifolius*, *Cyclostemon Bawanii*, *C. oligophlebium*, *Homalanthus concolor*, *Alchornea pubescens*, *Cleistanthus Barrosii*, *Mangifera parvifolia*, *Lophopetalum paucinervium*, *Meliosma bontocensis*, *Guioa mindorensis*, *Rhamnus mollis*, *Leea nitida*, *Saurauia longipedicellata*, *Pyrenaria mindanaensis*, *Calophyllum obliquinervium*, *Casearia mindanaensis*, *Aquilaria apiculata*, *Eugenia mirabilis*, *E. lancilimba*, *Schefflera bukidnonensis*, *S. halconensis*, *S. cinnamomea*, *Arthrophyllum Cenabrei*, *Alangium pilosum*, *Dimorphanthera mindanaensis*, *Styphelia philippinensis*, *Maesa megalobotrya*, *M. undulata*, *Ardisia calavitensis*, *Discocalyx brachybotrys*, *D. phanerophlebia*, *Embelia elliptica*, *E. luzoniensis*, *E. ovatifolia*, *Rapanea angustifolia*, *R. oblongibacca*, *Madhuca philippinensis*, *Linociera longifolia*, *Geniostoma acumi-*

natissima, *Strychnos Cenabrei*, *Tabernaemontana mindorensis*, *Kopsia grandiflora*, *Clerodendron luzoniense*, *Callicarpa magnifolia*, *Vitex unifoliolata*, *Limnophila obovata*, *Dichrotrichum coriaceum*, *Trichosporum mindanaense*, *Cyrtandra rufotricha*, *C. aclada*, *C. Barnesii*, *C. zamboangensis*, *C. parva*, *C. subglabra*, *Hypoestes mindorensis*, *H. axillaris*, *H. tenuis*, *H. confertiflora*, *Hemigraphis lanceolata*, *H. pachyphylla*, *Peristrophe cordatibractea*, *Strobilanthes pachys* C. B. Clarke, *Hallieracantha brevipetiolata*, *Tarenna pangasinensis*, *Cowiea philippinensis*, *Ixora myriantha*, *Pleiocarpidia lanaensis*, *Gardenia megalocarpa*, *Urophyllum mindorense*, *Argostemma arachnosum*, *Lasianthus mindanaensis*, *L. acuminatissimus*, *Hedyotis camarinensis*, *H. bambusetorum*, *Ophiorrhiza dolichophylla*, *Alsomitra simplicifolia*, *Lonicera mindanaensis*, *Pentaphragma mindanaense*, *Vernonia bontocensis*, *V. mindanaensis*, and *Lactuca integra*. The following new combinations also appear: *Ichnanthus vicinus* (F. M. Bail.), *Cleidion Ramosii* (Merr.), *Hallieracantha aequifolia* (C. B. Clarke), and *H. addisoniensis* (Elm.), with *H. Elmeri* as a new name for *Hypoestes pulgarensis* Elm. *Ficus argentea* Blanco, a species of previous entirely doubtful status, is redescribed. Eighteen species of Myrsinaceae recently proposed by Mez are reduced to previously described forms.—E. D. Merrill.

2208. MERRILL, ELMER D. *Studies on Philippine Rubiaceae, IV.* Philippine Jour. Sci. 17: 425-485. 1920.—In this 4th paper of the series, 62 new species are proposed, making 160 new species described in the whole series. The new species are as follows: *Gynochthodes mindanaensis*, *Hedyotis atropurpurea*, *H. brachyantha*, *H. catanduanensis*, *H. diffusissima*, *H. laxiflora*, *H. longipenduculata*, *H. oligantha*, *H. scaberrima*, *H. simplex*, *Ixora luzoniensis*, *Morinda coriacea*, *M. nitida*, *Mussaenda acuminatissima*, *Ophiorrhiza Macgregorii*, *O. ovata*, *O. pubiflora*, *O. stenophylla*, *O. tenuis*, *Plectronia brunnea*, *P. oligophlebia*, *P. Ramosii*, *P. subcapitata*, *Psychotria amplissima*, *P. capizensis*, *P. castanea*, *P. cardiophylla*, *P. cordatula*, *P. elliptilimba*, *P. fenicis*, *P. heteromera*, *P. lancilimba*, *P. longipetiolata*, *P. lucida*, *P. magnifolia*, *P. nagapatensis*, *P. obscurinervia*, *P. pallidifolia*, *P. panayensis*, *P. Piperi*, *P. pygmaea*, *P. scaberula*, *P. tricarpa*, *Randia rostrata*, *Tarenna acuminata*, *T. catanduanensis*, *T. elongata*, *T. littoralis*, *T. nitida*, *T. obtusifolia*, *T. stenantha*, *Pavetta Elmeri*, *P. multinervia*, *P. Williamsii*, *P. subferruginea*, *Timonius auriculatus*, *Urophyllum caudatum*, *U. affine*, *U. panayense*, *U. quadribacteolatum*, *Williamsia panayensis*, and *W. longistipula*. The status of *Tarenna* is discussed and 31 Philippine and Indo-Malayan species are enumerated, with the following new names: *T. angustifolia* (*Stylocoryna angustifolia* King), *T. adpressa* (*Stylocoryna adpressa* King), *T. Maingayi* (*Webera Maingayi* Hook. f.), *T. costata* (*Stylocoryna costata* Miq.), *T. pumila* (*Webera pumila* Hook. f.), and *T. buruensis* (*Stylocoryna buruensis* Bartl.).—E. D. Merrill.

2209. OSTERHOUT, GEO. E. *Two new plants from western Colorado.* Bull. Torrey Bot. Club 49: 183-184. 1922.—*Nuttallia marginata* and *Acrolasia humilis* are described as new species.—P. A. Munz.

2210. RADLKOFE, L. *Sapindaceae novae Philippinenses.* Philippine Jour. Sci. 20: 657-662. 1922.—The following new species are described: *Lepisanthes acutissima*, *L. macrocarpa*, *Hedyachras* gen. nov., *H. philippinensis*, *Trigonachras falcatuspidata*, and *Mischocarpus sublaevis*. An amplified description of *Euphorianthus obtusatus* Radlk., Mindanao-Celebes, is given.—E. D. Merrill.

2211. RENDLE, A. B., E. G. Baker, and S. LE M. MOORE. *A systematic account of the plants collected in New Caledonia and the Isle of Pines by Prof. R. H. Compton, M. A., in 1914.* Part 1. Flowering plants (angiosperms). Jour. Linn. Soc. Bot. London 45: 245-418. Pl. 13-24. 1921.—The paper enumerates 830 species, 230 of which are new, and there are 10 new genera. There are many peculiar endemic forms, and many species are recorded from the island for the 1st time. Much information is presented concerning the distribution of the flora of the region. The families represented by the largest number of species are the Orchidaceae, Euphorbiaceae, Rubiaceae, and Myrtaceae; the families Leguminosae, Saxifragaceae, and Apocynaceae are well represented. The new genera are *Comptonella* (Rutaceae),

Salaciopsis (Celastrineae), **Montagueia** (Anacardiaceae) (commemorating the late Mr. P. D. Montague, zoologist to the expedition), **Paracryphia** (Eucryphiaceae), **Enochoria** (Araliaceae), **Merismostigma** (Rubiaceae), **Tropalanthus** (Sapotaceae), **Depanthus** (Gesneraceae), **Adenodaphne** (Lauraceae), and **Dendrophyllanthus** (Euphorbiaceae). The new species are as follows: **MONOCOTYLEDONS** (by A. B. Rendle, who in each case is authority for the species). *Dendrobium Comptonii*, *Bulbophyllum lingulatum*, *B. Comptonii*, *Phreatia Comptonii*, *Phajus neocaledonicus*, *Calanthe oreadum*, *C. neocaledonica*, *Sarcochilus neocaledonicus*, *Acianthus nanus*, *A. culiciferus*, *A. bracteatus*, *A. corniculatus*, *Campynema neocaledonicum*, *Freycinetia Comptonii*, *F. monticola*, *Eriocaulon Comptonii*, *Costularia neocaledonica*, *Scleria neocaledonica*.—**DICOTYLEDONS**, Polypetalae (by E. G. Baker, who in each case is authority for the species): *Hibbertia Comptonii*, *H. dissitiflora*, *H. insulana*, *Drimys Comptonii*, *D. odorata*, *D. pauciflora*, *Ionidium serratum*, *Agatium rufo-tomentosum*, *A. longipedicellatum*, *A. Comptonii*, *Pittosporum penduliflorum*, *Garcinia Comptonii*, *Microsema Comptonii*, *Sterculia Comptonii*, *Elaeocarpus nodosus*, *E. toninensis*, *E. dolichopodus*, *E. Comptonii*, *Rysopteris taomensis*, *Boronella parvifolia*, *Melicope platystemon*, *M. montana*, *Comptonella albiflora*, *Evodia canalensis*, *E. lactea*, *Zanthoxylon neocaledonicum*, *Z. albiflorum*, *Dutaillaea Comptonii*, *Murraya flava*, *Dysoxylum Comptonii*, *D. gamosepalum*, *Sphenostemon Comptonii*, *Salaciopsis neocaledonica*, *Euroschinus rubromarginatus*, *E. sylvicola*, *Montagueia haplostemon*, *Semecarpus ngoyensis*, *Arthrocianthus grandifolius*, *A. Comptonii*, *Phaseolus neocaledonicus*, *Mucuna neocaledonica*, *Storkiella Comptonii*, *Albizzia Comptonii*, *Parinarium neocaledonicum*, *P. minutiflorum*, *Geissois magnifica*, *Codia tinifolia*, *Pancheria rubrivenia*, *P. communis*, *Spiraeanthemum Comptonii*, *S. rubescens*, *Polyosma Comptonii*, *Paracryphia suaveolens*, *Terminalia rubricarpa*, *Cloezia Comptonii*, *C. angustifolia*, *Myrtus proliza*, *M. luteoviridis*, *Eugenia gyrosepala*, *E. angustibracteolata*, *E. mouensis*, *E. stephanophylla*, *E. brachycalyx*, *E. hydrophila*, *E. ignambiensis*, *E. arborea*, *E. Comptonii*, *E. neocaledonica*, *E. toninensis*, *E. paniensis*, *Psidium kuakense*, *Casearia Comptonii*, *Homalium sylvicolum*, *Schefflera combouiensis*, *S. Comptonii*, *Dizygotheca polyantha*, *Eremopanax canalensis*, *Enochoria sylvicola*, *Apiopetalum arboreum*. **DICOTYLEDONS**, Gamopetalae (by S. Le M. Moore, who in every case is authority for the species): *Bikkia fulgida*, *B. alyxioides*, *B. truncata*, *B. Comptonii*, *Lucinaea neocaledonica*, *Randia Comptonii*, *Gardenia cerifera*, *G. sylvestris*, *Atractocarpus cucumicarpus*, *A. oblongus*, *Cyclophyllum cymosum*, *Merismostigma neocaledonicum*, *Ixora kuakensis*, *I. florida*, *I. Comptonii*, *Morinda ligustrina*, *Psychotria suaveolens*, *P. Comptonii*, *P. frondosa*, *P. pubituba*, *P. declieuxioides*, *P. laxissima*, *P. subpallens*, *P. rarifolia*, *P. roseo-tincta*, *P. lepidocalyx*, *P. toninensis*, *P. gneissica*, *P. patula*, *Cephaelis saltiensis*, *C. rubefacta*, *C. bouvardioides*, *Lagenophora neocaledonica*, *Erigeron neocaledonicus*, *Blumea canalensis*, *Scaevola rotundata*, *Dracophyllum compactum*, *Rapanea grandifolia*, *Chrysophyllum gordoniaefolium*, *C. floribundum*, *C. Comptonii*, *C. peninsulare*, *Planchonella serpentina*, *P. saligna*, *Palaquium neocaledonicum*, *Tropalanthus Sealyae*, *T. Comptonii*, *Symplocos calophylloides*, *S. munda*, *Melodinus paucivenosus*, *M. citricarpus*, *Rauwolfia suaveolens*, *Alyxia nummularia*, *A. Johnsoniae*, *A. serpentina*, *Pterochrosia Comptonii*, *P. neriifolia*, *Alstonia lanceolifera*, *A. retusa*, *A. Comptonii*, *A. saligna*, *Parsonsia Comptonii*, *P. effusa*, *P. taomensis*, *Tylophora insulicola*, *Marsdenia assimulata*, *Hoya limoniaca*, *Geniostoma lopeziaefolium*, *G. consimile*, *G. fluggeoides*, *G. oleifolium*, *Lindernia neocaledonica*, *Depanthus glaber* (*Coronanthera glabra* C. B. Clarke), *Pseuderanthemum Comptonii*, *Justicia pinensis*, *Myoporum rotundatum*, *Gmelina neocaledonica*, *Oxera crassiflora*, *O. Comptonii*, *O. gmelinoides*. **MONOCHLAMYDEAE** (by S. Le M. Moore, who, except where otherwise indicated, is authority for the species): *Timeroya canalensis*, *Atriplex jubata*, *Nepenthes humilis*, *Piper Comptonii*, *Hedycarya saligna*, *H. Engleriana*, *H. Comptonii*, *H. symplocoides*, *H. Perkinsiana*, *Trimenia neocaledonica* Bak. fil., *Adenodaphne corifolia*, *Litsea neocaledonica*, *Beauprea multijuga*, *B. Comptonii*, *Grevillea acervata*, *G. Comptonii*, *G. producta*, *Stenocarpus Comptonii*, *S. phyllodineus*, *Loranthus pustulatus*, *L. glaucescens*, *L. Comptonii*, *L. canalensis*, *L. angustiflorus*, *Exocarpus dilatatus*, *Ricinocarpus neocaledonicus*, *Dendrophyllanthus Comptonii*, *Phyllanthus triquetrus*, *P. durus*, *P. rhodocladus*, *P. induratus*, *P. casearioides*, *P. Comptonii*, *P. salacioides*, *P. maytenifolius*, *P. serpentinus*, *P. gneissicus*, *P. toninensis*, *P. pterocladus*, *P. castus*, *P. sylvicola*, *P. ligustrifolius*, *Acalypha finitima*, *Cleidion viridiflorum*, *C. sylvestre*, *C. panduratum*, *C. Comptonii*, *C. obovatum*, *C. paucidentatum*, *Macaranga longispica*, *M. mista*, *M. meiophylla*, *M. porrecta*, *Balanops reticulata*, *B. acicarpa*, *Ficus Comptonii*, *F. leptorhachis*, *F. oreadum*, *F. cretacea*, *F. campicola*.—A. J. Eames.

2212. ROBINSON, B. L. *Dyscritothamnus*, a new genus of Compositae. Contrib. Gray Herb. 65: 24-28. Pl. 1. 1922.—*Dyscritothamnus* is described as a genus of Compositae new to science. To it is assigned one species, *D. filifolius*. It is based upon a somewhat fragmentary specimen collected in 1840 by Ehrenberg near the boundary between Queretaro and Hidalgo in Mexico. It seems to be intermediate in relationship between the Eupatorieae and the Astereae but is tentatively referred to the former.—E. B. Payson.

2213. ROBINSON, B. L. Records preliminary to a general treatment of the Eupatorieae II. Contrib. Gray Herb. 65: 46-54. 1922.—The following species and varieties are described as new to science: *Eupatorium angulifolium*, *E. angulifolium* vars. *typicum* and *fratri*, *E. elegans* HBK. vars. *typicum* and *pubens*, *E. neriifolium*, *E. militare*, *E. sagittiferum*, and *Kanimia microphylla*. *Eupatorium subpenninervium* Sch. Bip. and *E. viscosum* HBK. are discussed.—E. B. Payson.

2214. ROWLEE, W. W. The genus *Costus* in Central America. Bull. Torrey Bot. Club 49: 283-292. Pl. 12-15. 1922.—A key to the Central American species of *Costus* is given with a discussion of the species, of which the following new ones are described: *C. bracteatus*, *C. sepacuitensis*, and *C. congestus*.—P. A. Munz.

2215. RUSBY, H. H. New species of trees of medical interest from Bolivia. Bull. Torrey Bot. Club 49: 259-264. 1922.—The following new species are published: *Nectandra coto*, *Ocotea pseudo-coto*, *Aerodictidium benense*, *Guarea Bangii*, and *G. alborosea*. The bark of the 1st one named is the source of "coto," that of the 2nd is sold as such but is worthless; the 4th furnishes spurious "cocillana."—P. A. Munz.

2216. SCHLECHTER, R. Orchidaceae Bradeanae Paulenses. Anexos Mem. Inst. Butantan [Bot.] 14: 1-68. Pl. 1-14, and frontispiece. 1922.—This paper is published as part of the Contributions to the Knowledge of the Orchid Flora of Brazil under the joint authorship of R. SCHLECHTER and F. C. HOEHNE. In the present paper, however, the senior author alone treats of an orchid collection made in the state of São Paulo, Brazil, by Alexandre Curt Brade. Much additional information is given concerning species previously described and the following new genera, species, and varieties are characterized: *Habenaria Bradei*, *H. polyrhiza*, *Pogonia paulensis*, *P. fragrans*, *Vanilla angustipetala*, *Pelexia septrum*, *P. laminata*, *Cyclopogon graciliscapa*, *C. Bradei*, *C. iguapensis*, *C. saxicolus*, *C. paulensis*, *C. multiflorus*, *Sarcoglottis tenuis*, *Stenorrhynchus Bradei*, *Cranichis Bradei*, *Physurus longicalcaratus*, *Pseudostelis* n. gen., *P. spiralis* (*Pysosiphon spiralis* Ldl.), *P. deregularis* (*Stelis deregularis* Rdr.), *P. Bradei*, *Physosiphon Bradei*, *Pleurothallis Bradei*, *P. subpicta*, *P. Curtii*, *P. transparens*, *P. Dryadum*, *P. sororcula*, *P. iguapensis*, *P. Alexandri*, *Octomeria similis*, *O. iguapensis*, *O. Bradei*, *O. gracilis* Lodd. var. *paulensis*, *O. Alexandri*, *Fractiunguis* n. gen., *F. reflexa* (*Hexisea reflexa* Reichb. f.), *F. brasiliensis*, *Epidendrum Alexandri*, *E. iguapensis*, *Eulophia longifolia* (HBK.) Schltr. var. *flavescens*, *Promenaea paulensis*, *Dipteranthus Bradei*, *Dichaea Cogniauxiana*, *Campylocentrum pubirachis*.—E. B. Payson.

2217. SCHNEIDER, CAMILLO. Notes on American willows, XII. Jour. Arnold Arboretum 2: 61-125. 1921 [1922].—This article concludes the series of papers on American willows by this author [see Bot. Absts. 1, Entries 801, 813; 3, Entries 1838, 1839; 4, Entries 1769, 1770; 7, Entries 1490, 2238, 2239; 8, Entry 741; 11, Entry 3236.]—It starts with a systematic enumeration of the sections, species, varieties, and forms of American willows; 116 species belonging to 23 sections are enumerated. This is followed by remarks on the hybrids of American willows hitherto observed and by remarks on the geographical distribution of American willows which consist chiefly of an enumeration under each state, province, or country of the species known to occur there. Analytical keys to the species of American willows form the 4th part of the article; 3 keys are provided, 1 for the determination of staminate specimens, 1 for pistillate specimens, and 1 for leaf specimens. An index to all the sections, species, varieties, and forms mentioned in the 12 papers constituting the series concludes the article. The following new names and combinations are proposed: *Salix arctica* f. *diplodictya* (Trautv.) S. Rebbiana f.

luxurians (Fern.) f. *capreifolia* (Fern.), var. *projecta* (Fern.), *S. pedicellaris* f. *tenuescens* (Fern.), *S. Scouleriana* f. *poikila* (Schneid.), \times *S. Glatfelteri* (*S. amygdaloides* \times *nigra*), \times *S. Grayi* (*S. argyrocalyx* \times *planifolia*), \times *S. gaspensis* (*S. brachycarpa* \times *chlorolepis*), and sect. *Mexicanae*.—Alfred Rehder.

2218. SCHULZ, O. E. *Cruciferae-Brassicaceae (pars prima)*. Das Pflanzenreich Heft 70. (IV, 105). 290 p., fig. 1-35. 1919.—In the present part the author treats the first 2 subtribes of the *Brassicaceae*, namely the *Brassicinae* and the *Raphaninae*. An extensive bibliography is included of papers dealing with the taxonomy, morphology, and anatomy of a larger or smaller number of species of these 2 subtribes. There is presented also a concise account of the general vegetative characteristics, the anatomy, the floral structure, the pollination, and the structure of the fruits, seeds and embryos of the plants considered in this paper. The *Brassicaceae* find their center of distribution in the Mediterranean region. In the western part of this region occur many highly differentiated and mostly monotypic genera. All the species of the 2 subtribes are native to the old world. Twenty-eight genera receive recognition and are treated in great detail. Keys are given to the subtribes, genera, and species. For each species a bibliography is given which includes the synonymy of the species; a lengthy description and statement of geographical distribution with the citation of some specimens also occurs. The principal genera treated are *Brassica* with 33 species, *Erucastrum* with 15, *Sinapis* with 8, *Diplotaxis* with 19, *Raphanus* with 8, and *Crambe* with 19. The following new species and specific combinations occur: *Brassica atlantica* (*B. oleracea* L. var. *insularis* (Moris) subvar. *atlantica* Coss.), *B. cadmea* v. Heldreich ms., and *Sinapodendron palmense* (*Brassica palmensis* O. Ktze). In addition to these there are a very great number of new varieties and new varietal combinations as well as a smaller number of other subspecific novelties.—E. B. Payson.

2219. SMITH, CHARLES PIPER. *Studies in the genus Lupinus*. VII. *L. succulentus* and *L. niveus*. Bull. Torrey Bot. Club. 49: 197-206. Fig. 75-78. 1922.—For North American annuals and biennials, outside of a few Mexican and Costa Rican species, 6 groups are recognized: *Stiversiani*, *Succulenti*, *Sparsiflori*, *Micranthi*, *Concinni*, and *Subcarnosi*; a key is given distinguishing between these groups. In the *Succulenti*, *Lupinus succulentus* Dougl. is used for the plant commonly known as *L. affinis* Agardh, a name which belongs to another species. *L. succulentus* Layneae and *L. succulentus Brandegeii* are described as new varieties. Under the *Micranthi* only *L. niveus* Wats. is treated in this paper.—P. A. Munz.

2220. THARP, B. C. *Commelinantia*, a new genus of the *Commelinaceae*. Bull. Torrey Bot. Club 49: 269-275. Pl. 10-11. 1922.—*Commelinantia* n. gen. is published for *C. anomala* (Torr.) n. comb., based on *Tradescantia anomala* Torr.—P. A. Munz.

2221. WEATHERBY, C. A. A new species of *Eleocharis* from Massachusetts. *Rhodora* 24: 23-26. 1922.—*Eleocharis fallax* n. sp., from Cape Cod, Massachusetts, an isolated northern representative of *E. arenicola* Torr. (South Carolina to California and Guatemala), *E. montana* (HBK.) R. & S. (tropical America), *E. Dombeyana* Kunth (Andes from Ecuador to Bolivia), and *E. truncata* Schlecht. (Mexico) are discussed and their diagnostic characters presented in a key.—M. L. Fernald.

2222. WIEGAND, K. M. *Carex laxiflora* and its relatives. *Rhodora* 24: 189-201. 1922.—This is a monographic revision of the group. The following are described and discussed: *C. albursina* Sheldon, *C. blanda* Dewey, *C. laxiflora* Lam., *C. ormostachya* n. sp., *C. crebriflora* n. sp., *C. ignota* Dewey, *C. anceps* Muhl., *C. striatula* Michx., *C. styloflexa* Buckley, *C. styloflexa* var. *fusiformis* (Chapm.) n. comb. based on *C. fusiformis* Chapm., *C. styloflexa* var. *remotiflora* n. var., *C. leptoneuria* Fernald.—M. L. Fernald.

2223. WIEGAND, K. M. Notes on some East-American species of *Bromus*. *Rhodora* 24: 89-92. 1922.—Keys are given to the introduced species of the *Bromus secalinus* affinity and

to the native species of the *B. ciliatus* group. The following are discussed: *B. secalinus* L., *B. secalinus* f. *hirtus* (F. Schultz) n. comb. based on *B. mutabilis* ♂ *hirtus* F. Schultz, *B. racemosus* L., *B. commutatus* Schrad., *B. hordeaceus* L., *B. hordeaceus* f. *leptostachys* (Pers.) n. comb. based on *B. mollis* β. *leptostachys* Pers., *B. ciliatus* L., *B. ciliatus* f. *denudatus* n. f., *B. ciliatus* f. *laeviglumis* (Scribn.) n. comb. based on *B. ciliatus laeviglumis* Scribn., *B. altissimus* Pursh, *B. altissimus* f. *incanus* (Shear) n. comb. based on *B. purgans incanus* Shear, *B. purgans*, *B. purgans* f. *laevivaginitus* n. f. and f. *glabriflorus* n. f.—M. L. Fernald.

2224. WIEGAND, K. M. Variations of *Carex annectans*. *Rhodora* 24: 73-74. 1922.—The 2 plants originally proposed by Bicknell as *Carex xanthocarpa* (1896) and *C. xanthocarpa annectans* (1896) prove to have well defined ranges, and are maintained as geographic varieties. The earlier *C. xanthocarpa* Degland (1807) necessitates the taking up of *C. annectans* Bicknell (1908) and the new combination *C. annectans* var. *xanthocarpa* (Bicknell) Wiegand.—M. L. Fernald.